

## **ABSTRACT**

FRANCAVILLA, NICOLE MARIE. The Influence of Virtual Leadership and Relationship Characteristic Variables on Follower Outcomes. (Under the direction of Dr. Adam W. Meade).

Globalization and communication technology advancements have led to a rise in companies' use of virtual or remote workers (i.e., employees who work at least part of their workweek away from a company office). Virtual work arrangements provide many benefits (e.g., diverse workforce, increased productivity, enhanced employee well-being), but also pose many challenges for virtual workers (e.g., feelings of isolation and uncertainty). Leadership has been suggested as one mechanism through which companies can optimize the experience of virtual workers, leading to a stream of research on effective virtual leadership. Virtual leadership studies tend to simplify the construct by examining only leader-follower distance or reliance on technology as its operationalizations, failing to examine the many nuances associated with working at a distance from one's leader. The present study examines a more holistic picture of the virtual follower's experience by investigating five leader-follower relationship characteristic variables: geographic distance, communication frequency, media richness, leader availability, and leader responsiveness. Relationships among these relationship characteristic variables and follower outcomes including job satisfaction, affective commitment, engagement, job performance, and leader effectiveness are examined to investigate the differential ways in which aspects of the leader-follower relationship dynamic influence followers' job attitudes and performance. Finally, the interactive effects of the relationship characteristic variables combined with generally beneficial (transformational, contingent reward) and generally detrimental (destructive) leadership behaviors on follower outcomes are examined. Results generally indicate that leader-follower geographic distance and the richness of media used to communicate do not meaningfully relate to followers' job satisfaction, affective commitment, engagement, job

performance, or leader effectiveness. The extent to which a leader provides a follower attention via communication frequency, availability, and responsiveness is much more predictive of positive follower job attitudes and performance. Supplemental analyses reveal differential moderating relationships among leader behaviors (transformational, contingent reward, destructive) and relationship characteristics (communication frequency, leader availability, leader responsiveness) on the set of follower outcomes. For example, leader-follower communication frequency exacerbates the negative effects of destructive leadership on all follower outcomes, and leader attention (via availability and responsiveness) moderates the relationship between leader behavior (transformational and contingent reward) and follower self-reported job performance such that leader behavior positively relates to performance when attention is high, but negatively relates to performance when attention is low. Implications for future virtual leadership research, applications in practice, and limitations are discussed.

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The Influence of Virtual Leadership and Relationship Characteristic Variables on Follower  
Outcomes

by  
Nicole Marie Francavilla

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## Introduction

Advanced communication technology enables individuals to complete work essentially anytime, anywhere, and with anyone around the world. As a result, virtual work, flexible work arrangements, or telecommuting (i.e., the ability to work away from a main company office for at least part of the workweek) has become increasingly prominent (Allen, Golden, & Shockley, 2015). While virtual work arrangements attract employees, increase diversity, and have the potential to positively impact organizational performance, they also can lead to communication challenges, ambiguity around work, and feelings of isolation (Bell, McAlpine, & Hill, in press). A virtual worker's leader can play an important role in determining the valence of the virtual work experience, and research shows that effective leadership in remote or distant settings can positively impact followers' trust, satisfaction, commitment, and performance (Bonet & Salvador, 2017; Golden & Veiga, 2008; Kelley & Kelloway, 2012; Timmerman & Scott, 2006). However, findings are mixed in terms of what makes virtual leadership effective, likely due to the numerous operationalizations of the "virtual context" variable. Researchers operationalize virtuality in several ways, including leader-follower physical distance, proportion of followers' time spent in a main office, dependence on technology, and media choice (Bell et al., in press), making it difficult to compare results across studies and draw conclusions about effective leadership behaviors in remote settings. In order to better understand the contingencies on which virtual leadership can benefit remote workers, the first purpose of this study is to holistically examine the virtual work experience by looking at several leader-follower relationship characteristic variables, including geographic distance, communication frequency, media richness, leader availability, and leader responsiveness. This study investigates the types of leader-follower working relationships that tend to exist in the workplace by examining how the

set of relationship characteristic variables define latent profiles of follower work experiences. This study also examines the relationships among relationship characteristic variables and follower outcomes including job satisfaction, affective commitment, engagement, job performance, and perceived leader effectiveness in order to determine which aspects of the leader-follower relationship are most important for each outcome. Finally, this study examines the ways in which transformational, transactional, and destructive leadership behaviors interact with characteristics of the relationship context to influence follower outcomes. Ultimately, this study aims to determine the aspects of the virtual leader-follower relationship that augment and/or negate leadership's influence on follower outcomes.

The following section describes the prominence of virtual work and the challenges faced by virtual workers. Then it defines virtual leadership, reviews relevant research, and outlines research gaps in the virtual leadership literature. Finally, it describes the present study.

### **Virtual Work**

Virtual workers are individuals who rely on electronic tools to communicate and who are distributed geographically from their leader and/or coworkers (Bell & Kozlowski, 2002). Researchers tend to view work “virtuality” on a continuum comprised of various dimensions such as media richness, synchronicity of communication, and the degree to which workers rely on technology to interact (Al-Ani, Horspool, & Bligh, 2011; O’Leary & Cummings, 2007; Zigurs, 2003). Most workers tend to lie somewhere in the middle of the continuum between two extremes, one characterized by face-to-face or collocated workers who communicate synchronously, and the other characterized by geographically distributed workers who communicate asynchronously via electronic tools (Al-Ani et al., 2011).

**Prominence of virtual work.** The Society of Human Resource Management reported in 2016 that the prominence of telecommuting had tripled over the previous twenty years, and approximately half of all companies utilize virtual work teams today (Bell et al., in press; Society for Human Resource Management, 2016). Additionally, 85% of workers in a sample drawn from 80 countries indicated they worked on a virtual team in 2016 (RW<sup>3</sup> CultureWizard, 2016).

The number of global virtual workers has grown for several reasons, including globalization, increased use of outsourcing, and continuous technological advancements (Bell et al., in press). Organizations have increasingly affordable access to ample options for advanced communication technology (e.g., chat-based messaging, video conferencing) which enable synchronous, rich communication and seamless information sharing (Bell et al., in press). Virtual work also appeals to organizations because the removal of geographic constraints on job candidates enables recruitment of an optimally skilled and culturally diverse workforce (Bell et al., in press; Shuffler, Kramer, & Burke, 2016; Zaccaro & Bader, 2003). Geographic dispersion combined with enriched information sharing capability also enables a 24-hour workday, enhancing organizations' productivity and efficiency (Dulebohn & Hoch, 2017). Additionally, virtual work opportunities can attract and retain employees (Martins, Gilson, & Maynard, 2004), increase morale, and reduce absenteeism (Solomon, 2000). Working from home allows employees more control over work-life balance, and some research shows that remote workers are less stressed, experience fewer distractions, and have increased quality of family life (Bell et al., in press; Carter, Seely, Dagosta, DeChurch, & Zaccaro, 2015; Solomon, 2000).

**Virtual work challenges.** Although there are many benefits to virtual work, these arrangements also present several challenges to organizations and their workers, and some researchers (e.g., Avolio & Kahai, 2003; Dahlstrom, 2013; Kelley & Kelloway, 2012; Liao,

2017) argue that remote work is more complex than collocated work. One reason for the complexity of remote work is that reliance on electronic tools poses communication challenges. Misinterpretation of messaging and inaccurate perceptions of others are likely to result from computer-mediated communication because participants lack nonverbal cues and rich social information (Kelley & Kelloway, 2012). Remote workers also have fewer opportunities to engage in spontaneous communication and to develop interpersonal relationships compared to collocated workers (Al-Ani et al., 2011; Kiesler & Cummings, 2002). These communication challenges can contribute to accelerated conflict and mistrust (Avolio & Kahai, 2003). Additionally, geographic dispersion means that individuals work in different time zones, come from various cultural backgrounds, speak different primary languages, and have different social norms (Bell & Kozlowski, 2002; Carter et al., 2015), which can potentially result in communication issues and reduced trust (Stahl, Makela, Zander, & Maznevski, 2010). Virtual workers also often feel isolated (Crandall & Gao, 2005; Dahlstrom, 2013; Kelley & Kelloway, 2012), or “out of sight, out of mind” to others in the company (Crandall & Gao, 2005; Gibson, Blackwell, Dominicis, & Demerath, 2002). They can be particularly sensitive to justice perceptions, especially regarding the fairness of information sharing and promotion opportunities for remote workers compared to onsite workers (Crandall & Gao, 2005). Virtual workers also face the challenge of adapting to their organization’s technology, and difficulty sharing information amongst team members can impair the coordination of remote work, ultimately impacting productivity (Al-Ani et al., 2011; Carter et al., 2015). Finally, because virtual workers are available via many forms of media, they can face work-life balance issues due to continuous interruptions and the ability to receive messages after working hours. The burden of constant availability has been linked to decreased performance and increased stress (Stokols, Shalini,

Runnerstrom, & Hipp, 2009), which can lead to burnout (Avolio, Sosik, Kahai, & Baker, 2014). Galustian (2014) interviewed virtual workers and found that they had a heightened need for interpersonal and contextual variables such as trust, relationship building, empowerment, and visibility compared to collocated workers. Effective leadership has been suggested as one way in which organizations can address the challenges faced by virtual workers.

## **Leadership**

Decades of research show that leadership behavior predicts follower performance, job satisfaction, and several other follower outcomes including job attitudes and retention (Lord, Day, Zaccaro, Avolio, & Eagly, 2017). Leadership can be defined as the process of exerting intentional influence over others to guide, structure, and facilitate activities and relationships (Yukl, 2006). It has also been defined as an influencing process that results from follower perceptions of leader behavior and attributions of a leader's dispositional characteristics (Antonakis & Atwater, 2002). Leadership behaviors typically manifest in two broad categories: initiating structure and consideration (Judge, Piccolo, & Ilies, 2004). Initiating structure refers to the monitoring, managing, and directing of task-related follower behavior, while consideration refers to relational behaviors that cater to the needs, values, and emotions of followers. Building upon research on initiating structure and consideration, Avolio and Bass (1991) presented the Full Range Leadership Theory, which they argue encompasses all types of behaviors in which a leader might engage, broken down into the dimensions of laissez-faire, transformational, and transactional leadership. Laissez-faire leadership is characterized by a leader not engaging in directive or relational leadership behaviors with followers. Transformational leadership is the process of influencing followers to transform their attitudes in a way that produces higher performance (Bass, 1985). By appealing to followers' trust, admiration, and respect,

transformational leaders motivate their followers to do more than they expected and to sacrifice for the group. Transformational leaders make emotional appeals to followers via four types of behavior: individualized consideration (differential personal treatment), inspirational motivation (painting a picture of the future), intellectual stimulation (challenging followers to grow), and idealized influence (charisma). Transactional leadership can be defined as the influence process by which a leader exchanges rewards for followers' effort (Burns, 1978). There are three dimensions of transactional leadership: contingent reward (leader provides adequate rewards for adequate performance), active management by exception (leader actively steps in when follower does wrong), and passive management by exception (leader steps in after follower does wrong).

Working at a distance from one's followers and/or communicating via technology can impair leaders' ability to engage in and convey both transformational and transactional leadership behavior (Bell et al., in press). For instance, distance can make it challenging to set goals and direction for a team, and to monitor followers' progress toward goal accomplishment (Shuffler et al., 2016). Additionally, the lack of informal face-to-face interaction can make it difficult to understand followers' interpersonal needs. Email and chat-based communication tends to involve more task-related topics (rather than non-work or social topics) than face-to-face interaction (Al-Ani et al., 2011), making it difficult for leaders at a distance to build interpersonal relationships and trust with their followers. Therefore, relationship building, motivational behavior, and the management of work dynamics are arguably more challenging from a distance (Hoch & Kozlowski, 2014).

**Virtual leadership.** Leadership research tends to assume that leaders interact with followers via close, personalized contact (Joshi, Lazarova, & Liao, 2009). Bligh and Riggio (2012) argue that existing leadership theories imply that communication frequency, distance, and

the media utilized do not matter in terms of how leaders influence followers. Al-Ani and colleagues (2011) question whether traditional leadership constructs are transferable to virtual leader-follower environments, and Liao (2017) argues that the benefits of virtual work assume the presence of effective leadership. In sum, traditional leadership theories may not necessarily apply to virtual leadership because it occurs in a different context. Avolio and Kahai (2003) argue that the differences in the leader-follower relationship in virtual work versus traditional work warrant a focus on “e-leadership” as a distinct construct to understand the dynamics of virtual leader-follower dyads.

***Virtual leadership definition.*** Virtual leadership has been referred to as e-leadership (Avolio, Kahai, & Dodge, 2000), remote leadership (Kelley & Kelloway, 2012), and distance leadership (Antonakis & Atwater, 2002) in the literature. One complexity in defining the virtual leadership construct is that it is highly intertwined with the context variable of virtuality (Bell et al., in press). Avolio et al. (2014) argue that the context is part of the virtual leadership construct, while Shamir (2013) argues that virtuality is a characteristic of the context of the leader-follower relationship, but not a characteristic of the leader him/herself. Zaccaro and Bader (2003) define an e-leader as a leader who conducts many processes via electronic channels. Avolio et al.’s (2000) definition focuses on the reciprocal relationship between leadership and technology (i.e., how technology has influenced leadership and how technology has transformed to facilitate leadership). Their latest definition was presented in 2014, which defines e-leadership as a “social influence process embedded in both proximal and distal contexts mediated by AIT [Advanced Information Technology] that can produce a change in attitudes, feelings, thinking, behavior, and performance” (pp. 617).

Several frameworks for virtual or distance leadership have been presented in the literature. Bogardus (1927) was the first to reference leadership distance, and Rummel (1976) referenced four categories of distance including material, psychological, social, and cultural distance. Napier and Ferris (1993) defined dyadic leader-follower distance on three dimensions: psychological, structural, and functional, and conceptualized physical distance in terms of these three aspects of the relationship. Antonakis and Atwater (2002) present the most commonly cited distance typology which defines leader-follower distance on a matrix with three dimensions: social distance, physical distance, and perceived interaction frequency. The authors equate social distance to psychological distance, and define it as “perceived differences in status, rank, authority, social standing, and power” between a leader and follower (pp. 682). Physical distance refers to how closely a leader and follower are located, and perceived interaction frequency refers to the follower’s perception of the frequency with which the leader-follower dyad communicates. Antonakis and Atwater argue that frequency of communication directly impacts how close followers perceive their leader. While these frameworks present a conceptual grounding for virtual leadership, they do not provide enough detail on the idiosyncrasies of each virtual worker’s experience with his/her leader. Rather than examining virtual leadership based on followers’ general perceptions about their leaders’ distance, this study focuses on specific aspects of the working relationship to more tangibly examine leader distance.

***Virtual leadership challenges.*** Some researchers argue that virtual leadership requires an additional skill set on top of the requirements of traditional face-to-face leaders (Bell et al., in press; Hoch & Kozlowski, 2014). One study found that 87% of leaders agreed that virtual leadership required more from them than collocated leadership, and 92% of senior executives agreed that virtual leadership required different skills than face-to-face leadership (Bell et al., in

press; Center for Creative Leadership, 2007). Another survey found that 80% of leader respondents reported that leading remotely affected their ability to perform initiating structure behaviors (Institute of Leadership and Management, 2015). Due to the ambiguity in virtual work settings and challenges faced by virtual workers, many researchers argue that virtual leadership behavior has more severe implications for follower outcomes than leadership behavior in traditional collocated settings (Bell & Kozlowski, 2002; Hill & Bartol, 2016; Hoch & Kozlowski, 2014; Joshi et al., 2009; Liao, 2017). Gibbs, Sivunen, and Boyraz (2017) refer to this concept as the “strong” leadership approach, which argues that virtual work requires stronger or *more* leadership behaviors (e.g., setting structural boundaries, coordinating team members, establishing a shared direction) than collocated work to produce positive outcomes. Golden and Veiga’s (2008) findings demonstrate the strong leadership effect. They found an interaction between leader-follower distance and leader-member exchange (LMX) behaviors, such that leader-follower dyads with a high LMX relationship had higher commitment when they were virtual compared to collocated, and that dyads with low LMX relationships had lower commitment in virtual compared to collocated dyads. Hoch and Kozlowski (2014) argue that strong leadership is a key mechanism through which organizations can mitigate motivation loss, coordination issues, and performance deficits that can potentially occur in virtual work settings. Gibson et al. (2002) suggest situational leadership theory, which states that one leadership style does not fit all workers nor all contexts (Hersey & Blanchard, 1982), as a framework for effective virtual leadership, arguing that virtual leaders must adapt their behaviors to demands of various leader-follower dyads, and in more complex ways than collocated leaders.

In Bell and Kozlowski’s (2002) discussion of leading virtual teams, they distinguish amongst challenges associated with different dimensions of the virtual working relationship. The

first dimension, temporal distribution (i.e., dispersion in different time zones), makes it challenging for leaders to monitor and manage follower performance because leaders cannot always physically observe the work. Another dimension, boundary spanning (i.e., the extent to which followers span different regions and cultures), means leaders need to adapt to different follower needs. Virtual leaders have followers across cultures in which norms vary in terms of power distance, uncertainty avoidance, and preferences for work-relevant behaviors such as receiving feedback (Erez, 2011). Virtual leaders also typically vary in the degree to which they work collocated and at a distance from their set of followers, adding to their role's complexity, and making it difficult to engage in one set of effective behavior for all followers and situations.

Virtual leaders face several other challenges. First, distance can make it difficult for leaders to establish an authoritative presence or communicate their hierarchical standing (Ocker, Huang, Benbunan-Fich, & Hiltz, 2011; Zigurs, 2003). Virtual leaders must establish a leadership presence without the physical cues that collocated leaders can utilize in traditional office settings, such as having a corner office or sitting at the head of the table in a meeting. Virtual leaders also face the difficult task of monitoring follower progress toward goals and general team processes without sight into day-to-day work tasks (Dulebohn & Hoch, 2017). The inability to synchronously manage followers' work presents challenges around detecting poor performance, mistakes, teamwork issues, and the need for additional resources (Bonet & Salvador, 2017; Carter et al., 2015). Unlike collocated leaders who can easily observe performance fluctuation or tension amongst team members, virtual leaders must find mechanisms to regularly gather this information in a reliable way (Avolio et al., 2014). Another challenge faced by virtual leaders surrounds communication with their followers. Use of technology can hinder leaders' ability to convey and interpret emotions, which can impede both relationship-building and motivational

behaviors (Avolio et al., 2014). For example, difficulty expressing positivity or excitement via technology can hinder leaders' ability to align team members to a common goal. For these reasons, some researchers argue that virtual leaders have less influence over their followers compared to collocated leaders (Dulebohn & Hoch, 2017). Additionally, communication issues pose challenges for information sharing between leaders and followers (Zander, Zettinig, & Makela, 2013). Difficulty sharing information can lead to performance issues as well as justice perception issues among team members around timing of information dispersion and the extent of consistency across team members. Another challenge for virtual leaders surrounds work-life balance. When leading a team located around the globe, leaders may feel pressure to make themselves available 24/7, especially with access to email and chat on devices at home. Leaders need to set boundaries as to whether they will respond to followers outside work hours, and they face risks for stress, burnout, and work-life balance issues (Avolio et al., 2014). Virtual leaders also face the challenge of keeping up with evolving technology. Additionally, Avolio et al. (2014) argue that as technology advances, certain leader behaviors may become even more important. Rich platforms such as video conferencing systems make it easier to express emotions and have interactions like those face-to-face, which puts pressure on leaders to convey authenticity when communicating via technology.

***Effective virtual leadership.*** Research has focused on practices to mitigate or overcome the challenges of virtual work. Armstrong and Cole (2002) found that leaders who provided coaching, modeled norms, initiated discussion with their team, set concrete goals, and acknowledged the difficulties of working virtually tended to have more successful virtual teams than leaders who engaged in less of these behaviors. Several qualitative studies have investigated effective virtual leadership behavior via interview data, with the following findings. Fisher

(2014) found that leaders who set clear goals, emphasized the pros of dispersed teamwork, and created a sense of community tended to have highly engaged teams. Kayworth and Leidner (2001) found that effective virtual team leaders mentored their followers, delegated, frequently communicated with followers, and displayed empathy. Weisband (2002) found that successful virtual leaders applied pressure to complete task demands and also demonstrated consideration for team members. Malhotra, Majchrzak, and Rosen (2007) utilized interview and survey data to identify six effective practices of virtual leaders: establishing trust via technology, encouraging appreciation and understanding of diversity, managing meetings, monitoring follower performance via technology, providing followers visibility beyond the team, and encouraging team members to work together. Desper (2014) looked specifically at leader behaviors that mitigated negative outcomes (i.e., project failures) and found that empathy, understanding, and respect for diversity of cultural norms were important. They also found that effective virtual leaders engaged in frequent communication, established group rapport, and held regular meetings for progress updates with direct reports. Finally, Dixon (2013) found that virtual team leaders had to hold team members accountable and ensure their followers had equal access to information more than leaders of collocated teams.

### **Research Gaps**

There are several mixed findings on the direct and moderating effects of virtual leadership on follower outcomes. Some studies have found negative effects of virtuality on followers' trust in their leader (e.g., Merriman, Schmidt, & Dunlap-Hinkler, 2007), as well as negative effects of leader distance on follower performance (e.g., Podsakoff, MacKenzie, & Bommer, 1996). Hoch and Kozlowski (2014) found that team virtuality (i.e., the extent to which teams were geographically dispersed, relied on technology to communicate, and were culturally

diverse) weakened the relationship between hierarchical leader behavior (i.e., transformational, leader-member exchange, and mentoring leader behaviors) and team performance. However, other studies have found that physical distance can augment the relationship between leader behaviors and follower performance (e.g., Orvis, 2004), and that remote leader-follower relationships can strengthen emotional bonding (Avolio et al., 2014; Jiang, Bazarova, & Hancock, 2013). Hill and Bartol (2016) found that the effect of empowering leader behavior (i.e., when leaders share power with followers to facilitate a supportive environment) on team collaboration was stronger on more dispersed teams and Joshi et al. (2009) found that the relationship between inspirational leadership behaviors and team member commitment was stronger on dispersed teams. This set of studies operationalized “virtuality” in different ways and looked at various leader behavior and follower outcome variables, making it difficult to draw one conclusion regarding when, or if, virtual leadership is beneficial or detrimental for followers.

While virtual leadership research continues to grow, there are many remaining knowledge gaps. The necessity for more research in this area has been expressed by several researchers (e.g., Al-Ani et al., 2011; Avolio et al., 2014; Bell et al., in press; Bonet & Salvador, 2017; Gilson, Maynard, Young, Vartiainen, & Hakonen, 2015; Golden & Veiga, 2008; Hoch & Kozlowski, 2014; Kelley & Kelloway, 2012; Liao, 2017; Schmidt, 2014) for many reasons. First, leadership research has generally lagged behind technology advancement, and the evolution of the technology used in the workplace has far outpaced the science of understanding its effects (Avolio et al., 2014). For example, very few virtual leadership studies examine the use of video conferencing systems or advanced chat-based messaging tools, with most studies focusing on traditional electronic tools such as email (Gilson et al., 2015).

Another issue with recent virtual leadership research is that many studies tend to simplify the virtual work construct. One way in which researchers simplify virtuality is by dichotomizing work as collocated or not. Categorizing workers as either remote or collocated overlooks the idiosyncrasies amongst work situations (Avolio et al., 2014). For example, two remote workers may spend varying degrees of time on site in an office, and they also might have extensive variability in how and where they conduct virtual work (e.g., from a coffee shop versus from a home office). Another way in which researchers have simplified virtuality is by studying one dimension of the construct at a time. Researchers tend to only examine physical distance or technology dependence as an operationalization of the “degree of virtual work” in a given study (Bell et al., in press). Virtuality has many nuances and measuring only one aspect of the context does not allow for examining any interactions amongst different dimensions of virtual work. For example, operationalizing virtual work via physical distance does not allow for consideration of two workers who may use technology in different ways (e.g., one spends a large portion of the day on video conference with his/her leader, while one interacts infrequently with his/her leader via email). This simplistic approach to operationalizing virtuality hinders researchers’ ability to draw conclusions about virtual work’s influence on leader-follower dynamics, and the different operationalizations have resulted in mixed findings in the literature. Gilson et al. (2015) call for a unified operationalization of virtuality so that conclusions can be drawn across studies. Additionally, Gibson and Gibbs (2006) looked at four dimensions of virtuality (geographic dispersion, electronic dependence, structural dynamism, and national diversity) in aerospace teams and found that the four dimensions were not highly intercorrelated and also had differential relationships with team outcome variables. These findings highlight the importance

of examining multiple aspects of the virtual work environment rather than drawing general conclusions about it based on one dimension.

Even studies that examine multiple dimensions of virtual work (e.g., measure both physical distance and technology use) still tend to simplify the construct, and Bell et al. (in press) argue that more research is needed on the interaction of physical distance with other virtual work variables. Avolio et al. (2014) also call for more research on the interaction of social and physical leader-follower distance, which likely both play a role in virtual dyad dynamics. Additionally, few studies examine how leadership behavior interacts with the use of technology to communicate (Avolio et al., 2014; Hambley, O'Neill, & Klein, 2007), and others call for more research examining the aspects of virtuality that moderate the relationship between leader behavior and follower outcomes (Bell et al., in press).

Another area warranting research is that on destructive leadership and virtuality. Most studies on leadership and virtual work examine transformational, transactional, or LMX behaviors. To the author's knowledge, no studies exist examining the role of destructive leadership in virtual contexts. Destructive leadership can be defined as repetitive or systematic leader behaviors that harm, or risk harm to, the organization and/or its members (Craig & Kaiser, 2012). Such behaviors can negatively affect follower performance, well-being, and satisfaction. Destructive leadership could potentially have an amplified effect in virtual contexts due to challenges forming interpersonal relationships. However, technology could also dampen the effect of destructive leadership on follower outcomes if, for example, experiencing destructive leadership via chat messages causes less harm to followers than experiencing it in person. More research is needed on how virtuality and destructive leadership interact to influence followers.

Other limitations in the virtual leadership literature surround study methodology. First, many studies have been conducted in a lab with undergraduate participants, which potentially do not generalize to the virtual worker population. Additionally, many of the studies investigating effective virtual leadership use qualitative methods, warranting the need for more quantitative studies to replicate the findings. Finally, most of the research on virtual leadership behavior focuses on virtual teams. Studies have extensively examined team-level outcomes such as trust, coordination, and communication amongst team members (Bell et al., in press). Research has not focused enough on the dyadic leader-follower relationship and individual-level follower outcomes. More research is needed to understand the specific remote experience of different workers to understand the nuances of how virtuality and leadership behavior influence followers.

### **Present Study**

The present study has three purposes. The first is to parse out the construct of virtuality by examining several characteristic variables of the leader-follower relationship. In an attempt to uncover a holistic picture of the types of leader-follower working relationships that exist, this study examines the latent profiles of workers based on five relationship characteristic variables of leader-follower dyads: geographic distance, communication frequency, media richness, leader availability, and leader responsiveness. The second purpose of this study is to address the mixed findings in the virtual leadership literature around which characteristics of the virtual work environment (e.g., geographic distance, technology usage, etc.) make leadership more or less effective. This study examines the relationship characteristic variables' relationships with five follower outcomes (job satisfaction, affective commitment, engagement, job performance, and perceived leader effectiveness) in order to determine whether certain aspects of the virtual working relationship differentially relate to follower outcomes. Finally, the third purpose of this

study is to determine under which circumstances virtual work is beneficial versus problematic for the leader-follower relationship. As Bonet and Salvador (2017) state, “the fundamental research question is not whether manager-worker separation affects worker performance, but when and how it does so” (pp. 245). This study examines the interactive effects of the relationship characteristic variables and traditional leadership behavior constructs (transformational, contingent reward, and destructive leadership) on follower outcomes in order to better understand the ways in which leader behavior and the virtual work context combine to benefit or inhibit followers. Ultimately, this study intends to address the mixed findings regarding whether virtuality augments, negates, or has no effect on the influence of leader behavior on follower outcomes.

This study addresses several limitations in the virtual leadership literature. First, it examines leader behaviors’ influence at the individual level rather than the team level. It also provides quantitative evidence to supplement existing qualitative research, and it utilizes a sample of full-time workers to supplement findings from research on students in laboratory settings. This study also examines destructive leadership’s interplay with virtual leadership, which has not been examined to date. The study findings have implications for future research on the construct of virtual work as well as implications for application in practice for organizations seeking to optimize the virtual work environment for leader-follower dyads.

**Relationship characteristic variables.** The following sections outline the study variables and present the research questions. First, the relationship characteristic variables are presented, then the follower outcomes, and finally the leader behavior variables.

**Geographic distance.** Geographic distance is the most common operationalization of the virtual or remote work construct (Bell et al., in press), and it tends to be measured in several

ways. Some researchers measure geographic distance in miles (O’Leary & Cummings, 2007), some dichotomize the variable based on whether members of a dyad live in the same city (Kelley & Kelloway, 2012), some examine the amount of time spent away from the office (Golden & Veiga, 2008), and some look at frequency of dyad contact (Neufeld, Wan, & Fang, 2010).

Research has produced mixed findings on the effects of working at a physical distance from one’s leader. Several studies reveal negative effects of leader distance, such as reduced follower performance and challenges coordinating work, problem solving, building trust, information sharing, and resolving conflict (Cramton & Webber, 2004; Hill, Bartol, Tesluk, & Langa, 2009; Hinds & Mortensen, 2005; Jarvenpaa & Leidner, 1999; Joshi et al., 2009; Podsakoff et al., 1996). However, some evidence exists in favor of geographic distance. For example, Henderson (2008) found that followers on dispersed teams were more satisfied with their leader. Additionally, Connaughton and Daly (2004) found higher leader identification in distant team members compared to collocated team members, but also higher feelings of isolation. They argue that remote workers may not blame their leader for feelings of isolation and instead see isolation as an inherent part of working remotely.

Many studies examine physical distance as a moderator, some finding that it enhances the relationship between leader behavior and follower outcomes, and some finding that it attenuates it. In support of an augmentation effect, Gibson and Cohen (2003) found that leadership behaviors had a stronger relationship with team effectiveness on teams with higher geographic dispersion. Similarly, Orvis (2004) found stronger effects of leadership behavior (initiating structure, monitoring processes, and facilitating team cohesion) on team performance in geographically dispersed teams compared to collocated teams. Howell, Neufeld, and Avolio (2005) also found a positive moderating effect for physical distance on the relationship between

contingent reward leader behavior and business performance. One explanation for an augmentation effect is that distance gives followers greater autonomy and empowerment, serving to build a trusting relationship with their leader (Bell et al., in press). In contrast, in support of an attenuation effect, Jawadi (2013) found that geographic distance negatively moderated the relationship between leadership coordination and relational behaviors and trust development with followers, and Torres (2018) found that followers of distant leaders reported lower trust in their leader than those of proximal leaders. One explanation for an attenuation effect is that physical distance makes it difficult to transmit influence or build the relationship foundation necessary to inspire followers via electronic communication (Neufeld et al., 2010). Howell and Hall-Merenda (1999) argue that distance between a leader and follower decreases the number of opportunities to directly influence, and Napier and Ferris (1993) argue that as the number of opportunities to observe followers decreases, their performance decreases. At the extreme, Kerr and Jermier (1978) argue that physical distance makes effective leadership behaviors impossible because it neutralizes their effect.

Some studies find no significant direct or moderating relationship between leader physical distance and follower outcomes. For example, Neufeld et al. (2010) found no relationship between leader-follower distance and perceived communication effectiveness nor leader performance. Similarly, Howell and Hall-Merenda (1999) found that distance did not moderate the effect of LMX behaviors on follower performance, and Barhite (2018) found that distance was unrelated to follower engagement and communication satisfaction. In interviews conducted by Al-Ani et al. (2011), followers reported no advantages of working collocated with their leader, even though there were more communication challenges reported in distributed teams. Interviewees felt their ideas were heard from a distance and that they did not experience

in-group/out-group dynamics. These findings suggest that there may be contingencies under which working at a distance does not have a negative effect, most likely due to communication tools, leader behavior (e.g., availability), and other aspects of the remote working experience that mitigate any negative outcomes that might typically come with distance. For example, Bonet and Salvador (2017) found task complexity to moderate whether distance enhanced or hindered follower performance, such that leader distance was negatively related to performance for tasks with high complexity, but unrelated to performance for tasks with low complexity. They also found that the negative effect of leader distance was mitigated when followers were collocated with coworkers. Given the differential outcomes that geographic distance produces in different situations, it is important to measure additional contextual variables rather than distance alone.

*Communication frequency.* Evidence shows that frequent communication can enhance task completion, and that it is even more important in virtual contexts compared to collocated ones (Schmidt, 2014; Zigurs, 2003). Technology arguably makes it easier for leaders to frequently interact with followers than face-to-face communication, with the ability to send messages when others cannot engage in person (Avolio & Kahai, 2003). Cummings (2008) states that frequent, informal interaction is the key success factor to leading distributed teams, and a common argument is that communication frequency can “reduce” distance or mitigate the potential negative outcomes of not working collocated (Torres, 2018). Empirical evidence supports this claim, as one study showed that frequent, unplanned, and informal communication mitigated the effect of team dispersion on conflict (Connaughton, Shuffler, & Goodwin, 2011). Additionally, frequent communication in virtual teams has been shown to have a positive direct effect on follower satisfaction and trust in leader (Kelley & Kelloway, 2012). As noted previously, distance can make it difficult for leaders to translate influential behaviors, but

researchers argue that engaging in frequent interaction can increase leaders' ability to engage in such behaviors and in turn strengthen their effects. Kacmar, Witt, Zivnuska, and Gully (2003) argue that leaders can augment the positive effects of LMX via frequent communication with followers, and Gajendran and Joshi (2012) provide evidence that communication frequency positively moderates the effect of LMX behavior on virtual team member influence on team decisions, which in turn positively predicts team innovation. These findings suggest that virtual leaders may need to expend more effort engaging in particular behaviors than collocated leaders to produce a similar effect. Walther (2008) posits that communication frequency contributes to positive LMX results because it enables relationship building and non-task interaction. Limited evidence shows that communication frequency is unimportant to the leader-follower context, but Barhite (2018) found no relationship between frequent communication and follower engagement.

An important implication for measuring communication frequency is that follower attributions of frequency are subjective. Antonakis and Atwater (2002) argue that followers' perceptions of their interaction frequency with their leader will directly influence how they view the leader. Frequent interaction is not always best, and it depends on followers' preferences in addition to the extent to which they need work-related guidance. Leaders must determine the extent of communication frequency that works for each follower and then balance meeting differential follower needs. Connaughton et al. (2011) state that "researchers run the risk of minimizing the complexities of communication by saying that it should be 'regular'" (pp. 506). More clarity is needed around the optimal degree of communication frequency in virtual leader-follower dyads, and it will likely be influenced by other contextual variables such as physical distance and media choice.

**Media richness.** Media richness pertains to the quality and ease with which information can be shared via electronic media (Daft & Lengel, 1986). Daft and Lengel define four components of media richness, which are the abilities to: send multiple verbal and nonverbal cues, use natural language, give and receive immediate feedback, and convey feelings and emotions. Robbins (1998) added that media richness is the ability to deliver multiple cues simultaneously. Examples of nonverbal cues are body language, physical posture, and facial expressions. Telepresence video conferencing is an example of rich media because it allows for the communication of many simultaneous cues and immediate back-and-forth conversation using natural language and displays of emotion. Text messages are an example of media low in richness because they cannot transmit nonverbal cues, feedback is not necessarily immediate, and they can distort emotions.

Most research on media richness in the virtual leadership literature finds that it contributes to follower outcomes. Avolio et al. (2014) argue that electronic communication tools can either enhance or hinder a worker's ability to communicate and share information. The medium chosen can potentially distort intentions of a message (Robbins, 1998), such as the misinterpretation of an emotion over email. In the virtual teams literature, choice of media has been shown to differentially affect outcomes. Low media richness can potentially attenuate leader influence (Dulebohn & Hoch, 2017) and the degree of media richness has been shown to influence the extent to which virtual teams develop trust (Avolio, Kahai, Dumdum, & Sivasubramaniam, 2001). Media richness has been shown to positively predict team performance and trust (Burgoon et al., 2002), and has also been shown to increase communication frequency in teams (Martins et al., 2004). Additionally, Hambley et al. (2007) found that team cohesion was higher in both face-to-face teams and teams that used videoconferencing compared to teams

that used chat to communicate. Huang, Kahai, and Justice (2010) examined media richness as a moderator to the effects of transformational and transactional leadership on team outcomes. They found that on teams with low media richness, transformational leadership increased cooperation amongst team members and transactional leadership increased task cohesion. On teams with high media richness, neither transformational nor transactional leadership influenced these outcomes. The authors posit that technology's ability to facilitate team communication plays a role in whether leader behavior influences team outcomes, and that with rich media, leadership might have less influence because technology acts as its substitute (i.e., technology facilitates team cooperation and cohesion more than leader behavior does). In contrast, Hambley et al. (2007) found no effect of media richness on team task performance, and Morgan, Paucar-Caceres, and Wright (2014) found that teams using a limited range of communication media did not have lower team effectiveness than those who had several media options. Most studies on the effects of media richness examine virtual team dynamics rather than leader-follower dynamics, warranting more research on the role it plays in the dyadic relationship.

***Leader availability.*** Another important relationship characteristic variable is the extent to which followers perceive their leader to be available. Even if the best communication mechanisms are in place, if followers do not feel that they can reach out to their manager when needed, then communication media likely will not be effective. Leader availability increases opportunities for timely feedback, guidance, and relationship building (Avolio et al., 2014). It is one of the three dimensions in Brown's (2017) definition of leader approachability, which is comprised of a leader's degree of availability, warmth, and receptivity. Approachability, and availability specifically, create opportunities for social and work-related interaction, which allow for more leader behaviors that can motivate followers and communicate important work-related

information (Northouse, 2012). Additionally, leader availability means that followers have more opportunities to share information upward, making it easier for leaders to monitor performance. Enhanced interpersonal relationships are also a likely outcome of leader availability (Brown, 2017). Research shows that followers of approachable leaders tend to voice their opinions more (Saunders, Sheppard, Knight, & Roth, 1992), and that followers who perceive their leader to be open experience higher psychological safety (Detert & Burris, 2007). Additionally, Connaughton and Daly (2004) found that perceived leader accessibility was related to followers' identification with their leader.

In virtual work environments, leader availability can potentially be more challenging to convey. In a collocated setting, a leader can use nonverbal cues such as leaving the office door open or completing work in a communal space with his/her team. Leaders likely need to concert more effort to communicate their availability in virtual environments, such as emphasizing that followers can email or call them when they need to talk. Leaders can also use mechanisms like recurring "1-on-1" meetings with their followers each week to make themselves available. Cascio and Shurygailo (2003) argue that regularly scheduled "1-on-1" conversations may be even more important for virtual followers than collocated followers because they may be the only point of interaction that a follower has with his/her leader that week or month. More research is needed to examine the relationships among leader availability and the other aspects of the remote work relationship.

***Leader responsiveness.*** In addition to making themselves available, it is important for leaders to be perceived as responsive. A leader who tells his/her followers to reach out any time, but then does not respond to their messages or has extremely delayed responses, likely will negate any benefits that might come from emphasizing availability. Additionally, even the best

communication technology would be ineffective if a leader did not respond to follower messages. Responding quickly to followers can facilitate leaders' convention of both initiating structure and consideration behavior. Avolio et al. (2014) argue that a fast response by a leader to give work guidance can also communicate individual consideration and investment in a follower's development. Timmerman and Scott (2006) found that leader responsiveness related to virtual team identification with leader, trust, and communication satisfaction.

With access to work communication on mobile devices and the ease with which followers and leaders can contact one another, researchers argue that technology is making it more challenging for leaders to be responsive, especially if they have followers working in many different time zones (Avolio & Kahai, 2003). Constant pressure to respond can have negative effects for leader stress, work-life balance, and burnout, in addition to slowing the leader's productivity because of the distraction and unpredictability that come with fielding follower messages (Avolio et al., 2014). Spending extensive time responding to followers might also deter a leader from engaging in particular leadership behaviors, illustrated by Rosen et al.'s (2018) findings that high email demands related to a lack of perceived goal progress for leaders, which led them to engage in less initiating structure and transformational leadership behaviors. Additionally, while leader responsiveness can facilitate a follower's productivity, research on synchronicity of communication shows that higher synchronicity is not always better, as some tasks require quick responses while others do not, and may even benefit from a delay giving individuals time to think about a response or to find the necessary information they need to share. Evidence shows that synchronous communication is more effective for complex tasks that require continual information sharing and constant collaboration (Balthazard, Waldman, Howell, & Atwater, 2002; Bell & Kozlowski, 2002), but asynchronous communication can be

sufficiently effective for tasks with low complexity (Bell & Kozlowski, 2002). More research is needed to understand the optimal degree of leader responsiveness as well as how responsiveness relates to other aspects of the virtual leader-follower relationship.

**Research question 1.** Because there is some potential overlap in the relationship characteristic variables listed above, and because the virtual context has been operationalized in many ways, this study first investigates how latent profiles of virtual workers are defined by the five relationship characteristic variables. Determining the most prevalent combinations of the relationship characteristic variables will provide a more holistic picture of what it means to work at a distance from one's leader rather than looking at different operationalizations of virtual work in turn. In sum, examination of the ways that relationship characteristic variables define the types of leader-follower dyads that exist will allow for parsing out the construct of virtuality and the ways in which it shows up in work contexts today.

*Research question 1:* What unique patterns of leader-follower relationship characteristics exist in leader-follower dyads?

**Follower outcome variables.** Several outcome variables have been examined in the virtual leadership literature. Using different outcome measures can make it difficult to make one conclusion on effective versus ineffective virtual leadership and to compare findings across studies in terms of what aspects of the virtual relationship matter. This study examines five variables that are commonly studied as outcomes of leadership in order to expand knowledge on the ways in which characteristics of the virtual environment affect different follower outcomes. The five follower outcomes are outlined in the following section.

**Job satisfaction.** Job satisfaction is a job attitude comprised of both affective and cognitive evaluations of one's job (Judge, Thoreson, Bono, & Patton, 2001). The affective

component refers to the degree of pleasure one feels from his/her job, and the cognitive component refers to his/her perception of whether the job fulfills his/her needs and preferences. Leadership behavior has been shown to predict job satisfaction, and there tends to be a stronger link between consideration leader behaviors and job satisfaction than initiating structure behaviors (Judge et al., 2004). In virtual work environments, job satisfaction has been shown to relate to transformational leadership (Kelley & Kelloway, 2012; Purvanova & Bono, 2009) in addition to relationship characteristic variables such as geographic distance and communication frequency in teams (Kelley & Kelloway, 2012).

*Affective commitment.* Commitment is another job attitude which can be defined as “a force that binds an individual to a course of action of relevance to one or more targets” (Meyer & Herscovitch, 2001, pp. 301). It is a multidimensional construct comprised of three distinct mindsets: affective, continuance, and normative commitment. In this study, the target of commitment is the organization (i.e., the extent to which an individual feels bound to the organization, or desires to remain in his/her current job). Affective commitment refers to the most internalized form of commitment, wherein an employee fully identifies with the organization and has a desire to remain working there (Meyer & Herscovitch, 2001). Normative commitment refers to more of an obligation to stay in the organization based on social norms and expected allegiance, and continuance commitment is the least internalized form, in which an employee remains in an organization because of the perceived costs of leaving (e.g., losing pay and benefits; Meyer & Herscovitch, 2001). The three dimensions of commitment tend to have similar directional relationships with outcome variables, but to varying degrees of strength, with affective commitment tending to be most predictive of performance, turnover, and other outcomes. Affective commitment has been found to relate to job performance, organizational

citizenship behaviors, and retention (Schleicher, Hansen, & Fox, 2011). Follower commitment has been shown to strengthen as a result of inspirational leadership in dispersed teams (Joshi et al., 2009), in addition to be more positively affected by LMX in virtual compared to collocated teams (Golden & Veiga, 2008). In line with other research on commitment in the virtual leadership literature, this study focuses on affective commitment as an outcome variable.

**Engagement.** Engagement can be defined as a focused energy directed toward organizational goals (Macey, Schneider, Barbera, & Young, 2009), or as an “active, positive work-related state that is characterized by vigor, dedication, and absorption” (Schaufeli & Bakker, 2004, pp. 295). Vigor refers to high levels of energy and mental resilience, dedication refers to feelings of significance, enthusiasm, and challenge with work, and absorption refers to full concentration and engrossment in work, making time pass quickly (Bakker, 2011). Engaged employees are likely to put forth more discretionary energy and work harder than employees who are not engaged (Bakker, 2011). Bakker (2011) distinguishes engagement from satisfaction by arguing that engagement is a more active attitude whereas satisfaction is more passive. Engagement has been found to predict job performance, positive emotions, and well-being (Bakker, 2011). In the virtual leadership literature, engagement has generally been shown to be unrelated to whether a follower works remotely (Barhite, 2018; Fisher, 2014). These findings could be due to the fact that engagement is more controlled by the follower (because it is active) and may be more influenced by individual characteristics than external variables.

**Job performance.** Job performance is the ultimate criterion of interest for organizations but also one of the most difficult to measure. It is comprised of three components: task performance, organizational citizenship behavior, and counterproductive work behavior (Rotundo & Sackett, 2002). This study focuses on task performance, which can be defined as

those behaviors formally recognized as part of one's job that contribute to the organization's technical core (Borman & Motowidlo, 1993). Individual job performance has been shown to predict organizational performance, satisfaction, and retention (Meyer, Becker, & Vandenberghe, 2004). It is commonly studied as an outcome of effective leadership. There have been mixed findings around how a virtual work context affects follower performance. Transformational leadership has been shown to affect performance more in collocated teams compared to virtual teams (Howell et al., 2005), but contingent reward leadership has been shown to more strongly influence performance on virtual teams (Bell et al., in press).

***Leader effectiveness.*** Leader effectiveness is the overall perceived performance of a leader, and it is a commonly measured construct when determining which aspects of leader behavior are most important (Barling, Cristie, & Hopton, 2011). Antonakis and Atwater (2002) argue that a follower's perception of leader effectiveness hinges on the leader's ability to match the degree of distance a follower desires in a given context. As reviewed above, many researchers have claimed a virtual work environment may pose challenges for effective leadership, and there is potential for the virtual context to either enhance or negate leader effectiveness (Avolio et al., 2014).

***Research question 2.*** To determine which types of the virtual context are most important, this study examines the relationships between the relationship characteristic variables and follower outcomes. Examining each relationship in turn allows for investigating which particular aspects of the leader-follower dynamic are most related to particular follower outcomes, so that specific conclusions can be drawn around what makes leadership effective in remote settings.

***Research question 2:*** How do characteristics of the leader-follower relationship (geographic distance, communication frequency, media richness, leader availability, leader

responsiveness) relate to follower (a) job satisfaction, (b) affective commitment, (c) engagement, (d) job performance, and (e) leader effectiveness?

**Leadership behavior variables.** Finally, to address the call for examining how leadership behaviors interact with the virtual context to predict follower outcomes, this study examines the interactions of the relationship characteristics with established leader behaviors that are known to be beneficial and detrimental for followers: transformational, contingent reward, and destructive leadership.

***Transformational leadership.*** Transformational leadership, the process by which leaders appeal to the emotions of followers in order to produce higher performance, has been shown to produce several beneficial outcomes including job satisfaction, motivation, and performance (Bass, 1985; Lowe, Kroeck, & Sivasubramaniam, 1996). Some research shows a positive direct relationship between transformational leadership and follower performance in virtual environments (Lewandowski & Lisk, 2012; Wotjara-Perry, 2017). There have been mixed findings on the interaction between the virtual work context and transformational leadership on follower outcomes. Some studies find that virtuality attenuates the effects of transformational leadership, acting as a boundary condition of its effects (e.g., Howell et al., 2005), while some find that virtuality strengthens the relationship between transformational leadership and follower outcomes (e.g., Schmidt, 2014). The explanation for an attenuating effect is that in virtual work environments, it is more challenging for leaders, and they also have less opportunities, to convey transformational leadership to their followers at a distance and via technology (Bell et al., in press; Shamir, 1995). The explanation for an augmentation effect is that in the virtual environment, behaviors of the leader become more important and influential in the absence of other work cues. Davis et al. (2003) found that compared to transactional and laissez-faire

leaders, transformational leaders had more effective and committed virtual teams. Huang et al. (2010) found that transformational leadership enhanced cooperation in virtual teams using technology low in media richness, and Johnson (2013) found that teams with transformational leaders tended to be more satisfied than teams with transactional leaders in dispersed Navy Special Operations teams. Kelley and Kelloway (2012) found that transformational leadership mediated the effect of contextual variables (perception of control, prior knowledge about leader, unplanned communications, regularly scheduled communication) on follower outcomes (job satisfaction, commitment, and trust) in virtual teams, but not in proximally located teams, indicating that transformational leadership was more important in the virtual environment. Purvanova and Bono (2009) also found support for the claim that transformational leadership behaviors are more influential in virtual settings. They studied leadership behavior longitudinally, and found that the most effective leaders (i.e., leaders of the highest performing teams) were those who increased their degree of transformational leadership over time. They concluded that the sense of uncertainty and ambiguity inherent to the virtual setting creates an opportunity for transformational behaviors to influence followers. They argue that leadership behaviors are even more important in virtual settings because there is a greater opportunity to influence in a virtual team versus a collocated team due to the social and psychological uncertainty and reduced noise from other influential variables.

In contrast, some support exists for the claim that distance attenuates transformational leadership's effect. Howell et al. (2005) found that transformational leadership positively predicted team performance in proximal teams, but not in dispersed teams. Howell and Hall-Merenda (1999) also found that transformational leadership was more predictive of follower performance in collocated teams compared to dispersed teams. Huang et al. (2010) found that in

teams using communication technology high in media richness, transformational leadership did not predict performance. They argue that the influence of leadership is attenuated when media is rich enough for seamless communication and information sharing amongst team members. More research is needed to understand the ways in which transformational leader behaviors interact with aspects of the virtual environment to influence followers' work experience.

***Transactional leadership.*** Transactional leadership, or the process of motivating followers via an exchange process of rewards for performance (i.e., recognition, explaining incentives, rewarding good performance) has been shown to produce beneficial outcomes such as follower job satisfaction and performance (Lowe et al., 1996). Some researchers argue that transactional leadership can enhance follower outcomes in the virtual environment because it means that leaders are setting structure for their followers and removing work ambiguity (Bell et al., in press). However, an alternate argument is consistent with that for transformational leadership, stating that distance or communicating via technology can attenuate the effects of transactional leadership because it dampens leaders' ability to convey these behaviors. Antonakis and Atwater (2002) argue that followers of distant leaders may view them as less active, and Howell and Hall-Merenda (1999) argue that distance can make it more difficult to observe behavior and provide timely recognition. Evidence exists for both an augmentation and attenuating effect. In favor of transactional leadership's effects in virtual work settings, contingent reward leader behaviors have been shown to more positively predict follower performance when leaders are at a distance versus collocated (Bell et al., in press). Additionally, Zhang et al. (2009) found that leader delegation was associated with higher follower satisfaction and motivation in dispersed teams. Huang et al. (2010) found that transactional leadership was associated with high task cohesion in virtual teams using technology low in media richness.

Howell et al. (2005) found that distance positively moderated the relationship between contingent reward leader behaviors and follower performance. However, when teams utilized media high in richness, the effect of transactional behaviors was neutralized, indicating that effective technology may negate the amplified importance of leadership in virtual environments. In addition, Podsakoff, Todor, Grover, and Huber (1984) found that distance negatively moderated the effect of contingent reward behavior on follower performance. More research is needed to understand the combined influence of transactional leadership, distance, and the virtual context on follower outcomes. The present study focuses specifically on contingent reward behavior because it is the most predominantly studied in previous literature.

***Destructive leadership.*** Destructive leadership, or leader behaviors that harm or intend to harm an organization and/or its members, has been shown to negatively affect follower satisfaction, performance, well-being, and retention (Craig & Kaiser, 2011). Destructive leadership has not been explored in the virtual leadership literature. Studies tend to focus on how positive leadership behaviors affect follower outcomes in virtual environments but fail to examine the effects of destructive leader behaviors in virtual environments.

***Research question 3.*** To answer the call to investigate how aspects of the virtual work environment interact with leader behaviors, this study examines the relationship characteristic variables as moderators to the relationship between leadership behaviors and follower outcomes. Specifically, it utilizes relationship characteristic profile membership (identified from Research Question 1) as a moderator to the relationship between leader behaviors and follower outcomes. Ultimately, this study seeks to determine under which circumstances transformational and contingent reward leadership can be particularly effective in addition to the circumstances under which destructive leadership can be particularly detrimental for follower outcomes.

*Research question 3:* Does leader-follower relationship profile (comprised of geographic distance, communication frequency, media richness, leader approachability, and leader responsiveness) moderate the relationship between leadership behaviors (transformational, contingent reward, and destructive leadership) and follower outcomes (job satisfaction, affective commitment, engagement, job performance, and leader effectiveness)?

**Contributions summary.** In sum, this study has three goals. First, it aims to holistically examine what it means for a follower to work at a distance from his/her leader by determining the types of leader-follower relationship dynamics that exist. Additionally, it examines how aspects of the leader-follower relationship dynamic differentially relate to follower outcomes. Finally, this study examines how leader-follower relationship characteristics interact with generally beneficial and generally detrimental leader behaviors to influence follower outcomes.

## **Method**

### **Participants**

The sample size for this study was determined based on three criteria. First, I conducted a power analysis using G\*Power for a relative weights analysis, which indicated that for a linear multiple regression with seven predictors, in order to detect effect sizes of .15 with .95 power, the minimum required sample size is 153.<sup>1</sup> Second, I utilized findings from Sheih's (2018) investigation of required sample sizes to determine differences in simple slopes when testing for an interaction between a continuous and categorical variable. For a categorical variable with unbalanced groups and a sample size of 168 (with groups sized 21, 42, 42, 63), Sheih demonstrated capability to identify effect sizes of .07 with power of approximately .80. Finally, to determine the appropriate sample size for a Latent Profile Analysis (LPA), I referred to Tein,

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<sup>1</sup> At the time of this dissertation's proposal, I intended to use seven predictors. In the present study, only 5 predictors were utilized. Given that the original power analysis was for more predictors, I did not re-run the power analysis.

Coxe, and Cham's (2013) investigation of the sample size requirements to correctly identify the number of classes in an LPA. They found that *Cohen's d* of .80 between classes could be identified with a sample size of at least 500 participants with ten indicators. They also reviewed LPA methodology in the literature and found that between January 2007 and March 2010, the median sample size utilized for an LPA was 377, with a range from 79 to 5,183. Based on these findings, I intended to collect data from a minimum of 500 participants.

**Data collection and screening.** Participants were crowdsourced workers on Amazon's Mechanical Turk (MTurk) who received \$0.75 as compensation for completing the study. Inclusion criteria required participants to be at least 18 years old, reside in the United States, work at least 30 hours per week, report directly to a manager at work, and have reported to that manager for at least six months. Of those who accessed the survey, 785 participants met the screening criteria. Two cases were removed from the dataset that were identified as repeat participants, leaving a sample of 783. I followed procedures outlined by Meade and Craig (2012) and Francavilla, Meade, and Young (2018) to screen participants for careless responding via the instructed-response, response time, and Maximum LongString indicators. In addition, I screened for careless responding by identifying nonsensical responses to open-text items. The following steps were taken to remove careless responders from the dataset.

The survey included two instructed-response items (i.e., "Select 'Strongly disagree' for this item") for which 69 participants incorrectly responded to one of the items, resulting in removal from the dataset, leaving a sample of 714 participants. To screen for response time, participants who completed the survey in less than 4 minutes were removed from the dataset. The average response time was 11.15 minutes ( $SD = 6.75$ ). One standard deviation below the mean was 4.40 minutes, and I rounded down to create a more lenient cut score. This cut score

was logically sound as anyone who completed the survey in less than 4 minutes could not plausibly have read every item on the survey carefully. Twenty-one participants were removed based on this cutoff, leaving 693 participants. Next, I screened for nonsensical responses to open-text items. This entailed removing participants for a variety of reasons, such as entering 1,961 as one's age, reporting job tenure as 100 years, or reporting working more hours virtually per week than one listed for the total number of hours worked per week. Screening for nonsensical responses removed 52 participants, leaving a sample of 641. Finally, I screened participants for the Maximum LongString careless response indicator. I selected two sub-sections of the survey for which to compute the indicator that included several Likert-type items displayed in a matrix format. The first sub-section was a string of 37 items, and the second sub-section was a string of 50 items. For each participant, I computed two Maximum LongString scores corresponding to these two sub-sections following procedures outlined by Meade and Craig (2012). I set Maximum LongString cut scores two standard deviations above the mean, resulting in flags for participants who had a string of more than 11 of the same responses in a row for either sub-section. Twenty-six participants were removed from the dataset based on the Maximum LongString screening, leaving a final sample size of 615 participants.

**Demographics.** The final sample for this study consisted of 615 MTurk workers. Participants' average age was 35.65 years ( $SD = 10.73$ ) and 54% of the sample was female. Approximately 7% of participants identified as Asian or Asian American, 12% as Black or African American, 76% as White, 0.05% as American Indian or Alaskan Native, 0.03% as Native Hawaiian or Pacific Islander, and 4% as other races. Twelve percent of the sample identified as Hispanic or Latino. Approximately 7% of the sample reported an annual salary below \$20,000, 55% reported between \$20,000 and \$59,999, 27% reported between \$60,000 and

\$99,999, and 12% reported \$100,000 or more. Sixty-four percent of the sample had a bachelor's degree or higher. When asked to indicate the geographic scale of their company, approximately 16% of the sample reported they worked in a global company, 11% multi-national, 26% national, 13% regional, 15% state, and 20% local. Participants reported working an average of 40.91 hours per week ( $SD = 5.71$ ). They reported working an average of 9.88 ( $SD = 14.35$ ) hours a week virtually or away from a company office, and they estimated that an average of 18.29% ( $SD = 28.11$ ) of their time spent working was done virtually or away from a company office. They reported an average job tenure of 4.06 years ( $SD = 4.64$ ) and reported having worked for their current manager for an average of 2.94 years ( $SD = 3.25$ ).

### **Procedure**

After the inclusion criteria items, participants completed the demographic items outlined above. Then they completed a set of relationship characteristic scales, followed by follower outcomes scales, and then leadership behavior scales. See Table 1 for a full list of survey items corresponding to the study variables.

**Relationship characteristics.** Participants completed the following items about their work context and interactions with their manager. The operationalization of each variable is outlined in each section.

**Geographic distance.** Participants provided the primary city in which they work and the primary city in which their manager works. To compute the geographic distance between participants and their manager, the physical distance in miles was calculated between the cities, consistent with the operationalization of physical distance outlined by O'Leary and Cummings (2007). Fourteen cases were coded as NA due to missing values. Participants worked an average of 78.37 miles ( $SD = 437.69$ ) from their managers. The data were extremely skewed, as 87% of

the sample reported working in the same city as their manager. Of those who did not work in the same city as their manager, participants worked an average of 735.90 miles ( $SD = 1,154.52$ ) from their manager, with two extreme outliers whose managers work in Europe.

Physical distance in miles was converted to an ordinal variable ranging from 1 to 5 using a logic-based approach.<sup>2</sup> Participants who reported working in the same city as their manager received a 1 (87% of sample). Then participants who listed a different primary city from their manager were coded as follows: those in cities 1 mile to 59.99 miles apart received a 2 (5%), 60 to 119.99 received a 3 (.08%), 120 to 179.99 received a 4 (.03%), and 180 or above received a 5 (5%). Cut scores of 60-mile increments corresponded to breaks at approximately one additional hour of driving distance per bucket. This approach was logically sound, as individuals who worked less than 60 miles from their manager (less than a 1-hour drive) are likely to have a different experience than those who work between 1-2 hours away, etc. The cut for any distance above 180 miles (approximately a 3-hour drive) was chosen because it was assumed that the experience of working 3 hours away from a manager likely does not drastically differ from working 4, 5, or more hours away, given the low likelihood of driving to see one's manager at these distances. Based on this coding, the mean for geographic distance was 1.27 ( $SD = .90$ ).<sup>3</sup>

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<sup>2</sup> The original intent was to use a statistical approach to place participants in buckets by converting the non-zero values to z-scores and setting cuts at one and two standard deviations above and below the mean, but given the skewed nature of the data, this was not the optimal approach as the resulting cut scores did not make logical sense (i.e., one bucket would include participants ranging from 1 mile to 734.31 miles, and the next bucket would include participants from 756.91 to 1,858.29). It did not make sense to create a cut score between participants in the 700 mile range.

<sup>3</sup> In addition to the physical distance operationalization of geographic distance, I included two single-item measures of geographic distance. I utilized Howell and Hall-Merenda's (1999) adaptation of Klauss and Bass' (1982) single item which asks participants to rate their physical proximity to their manager on a 5-point scale ranging from 1 (very close—i.e., same floor, within 100 ft or 30 miles) to 5 (very distant—i.e., different city). I also utilized an operationalization based on Merriman et al. (2007) which asks participants to rate on a 5-point agreement scale whether they typically work at the same address as their manager. Examination of the distribution of responses to these items indicated that they were consistent enough with the physical distance operationalization, and as a result they were not included in the analyses. The proximity item mean was 1.98 ( $SD = 1.37$ ) and the "same address" item mean (after reverse-coding) was 1.80 ( $SD = 1.25$ ). They correlated with the physical distance measure at .54 and .55, respectively, and examination of an EFA of these items with the physical distance ordinal variable indicated they

**Communication frequency.** Participants provided overall ratings of their communication frequency with their manager on a 4-item scale adapted from McAllister (1995). An example item is “How frequently does your manager initiate work-related interaction with you?” Response options were on a 7-point Likert-type scale from 1 (*once or twice in the last six months*) to 7 (*many times daily*). These anchors are based on those used by Hoch and Kozlowski (2014) and Kacmar et al. (2003). The scale displayed high internal consistency reliability ( $\alpha = .84$ ). A confirmatory factor analysis (CFA) indicated strong fit for a one-factor structure for these items,  $\chi^2(2) = 11.90, p = .00, CFI = .99, TLI = .98, RMSEA = .09 [.05, .14], SRMSR = .07$ .

**Media richness.** To measure media richness, Subject Matter Expert (SME) ratings were utilized to code participants’ reported use of a variety of media. The process is outlined below.

**SME ratings.** Twelve industrial-organizational psychology doctoral students were utilized as SMEs for the media richness ratings. They were provided the following prompt, written based on Carlson and Zmud’s (1999) definition of media richness: “Media richness can be defined as the quality and ease with which information can be shared via electronic media, pertaining to the abilities to: simultaneously send multiple verbal and nonverbal cues, use natural language, give and receive timely feedback, and convey feelings and emotions. Based on this definition, please rate the richness of each form of media below.” They were then provided a list of media and asked to rate them from 1 (*very low richness*) to 5 (*very high richness*). The media listed were face-to-face communication, video call (via Webex, Skype, telepresence, FaceTime, etc.), phone call (direct phone call or computer-mediated phone call with **no video** such as Webex or Skype call), collaboration tool message (such as Slack, Microsoft Teams, Webex Teams, Facebook

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loaded onto one latent factor. Given the more objective nature of the physical distance item, I opted to only retain this measure for analyses.

Workplace, Fleep, etc.), text-based chat or instant message (via text message, iMessage, or a text-based instant messaging tool that is **not a Collaboration tool**), email, and fax. A one-way ANOVA was conducted to test for differences in richness ratings provided across the media types, and the global  $F$ -test was significant,  $F(6) = 52.93, p < .01$ . Follow-up Tukey Honest Significant Difference tests amongst each pair of media were then examined (see Table 2), which indicated that face-to-face communication received significantly higher richness ratings than all other media. Video call had the next highest ratings and it also significantly differed from all other media. Phone call had the next highest ratings, and it significantly differed from every other media besides collaboration tool message ( $p = .29$ ). Collaboration tool message did not significantly differ from text-based messages ( $p = .86$ ) or email ( $p = .68$ ), and text-based messages and email did not significantly differ from one another ( $p = 1.00$ ). Fax was significantly lower than all other media. Based on these results, I collapsed collaboration tool message, text-based chat or instant message, and email into one category. Although richness ratings for phone calls did not significantly differ from collaboration tool messages, I did not include phone calls into this category because based on logical interpretation, I argue that phone calls should stand separately from the text-based communication tools, and because phone call richness ratings significantly differed from text-based messages ( $p = .01$ ) and email ( $p = .00$ ).

Based on the SME ratings, I coded media richness as follows: face-to-face communication as 5, video call as 4, phone call as 3, collaboration tool message, text-based chat or instant message, and email as 2, and fax as 1. I then utilized these scores to code participants' responses to the media richness items in the survey.

*Participant media richness.* Study participants were provided the same list of media described above and asked to estimate the percentage of their total time spent communicating

with their manager that was done via each medium. Survey logic required their reported percentages across media to sum to 100. Reported percentages for collaboration tool messages, text-based chat or instant messages, and email were summed to create one score across these buckets. Then, the media richness variable was computed by weighting the reported percentages based on the SME richness coding. First, the percentage reported for each media was multiplied by its coded 1-5 value, and then a sum for all media was computed for each participant. For example, a participant who reported using face-to-face communication 80% of the time, video call 5% of the time, and email 15% of the time would receive a media richness score via the following formula:  $.80*5 + .05*4 + .15*2$ . This resulted in media richness scores ranging from 1 to 5, with a mean of 3.73 ( $SD = .86$ ).

***Leader availability and leader responsiveness.*** Leader availability was measured using the availability subscale of the Leadership Approachability Scale developed by Brown (2017) with slight modifications. Brown's items referred to the way in which a leader was available to his/her set of employees, and the language was modified for participants to provide responses at the individual level. Additionally, language in some items was modified to make them relevant for interaction at a distance rather than specific to a collocated leader-follower dyad. For example, the original item "My supervisor welcomes unscheduled visits from employees" was modified to: "My manager welcomes unscheduled conversations with me." One item from Brown's original scale was not included in this study because it did not lend to virtual leader-follower interactions, as it referred to whether a leader kept his/her door shut. The leader availability scale utilized in this survey included seven items.

A leader responsiveness scale was developed for this study. The original scale included nine items, such as "When I send my leader a message, I know he/she will respond," and "My

manager ignores my emails” (reverse coded; see Table 1 for full scale). Response options for both the leader availability and responsiveness scales were on a Likert-type agreement scale from 1-5.

Because of the close conceptual relationship between these two scales, their factor structure was examined together, and the Appendix provides a detailed outline of the factor analysis steps. Based on the factor analyses, I concluded that the leader availability and leader responsiveness scales were distinct, and I removed the reverse scored items for these scales from all analyses due to reverse-coded items loading onto separate factors from the positively-coded items. This entailed removal of three leader availability items and four leader responsiveness items. The four remaining positively worded leader availability items displayed high internal consistency reliability ( $\alpha = .84$ ), as did the five remaining leader responsiveness items ( $\alpha = .87$ ). These scales correlated at  $.76$  ( $p < .001$ ).

**Follower outcomes.** After the relationship characteristics scales, participants completed the following scales about their work attitudes and performance. All items had response options on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*) unless otherwise noted. I conducted individual CFAs to confirm the single-factor structure of each scale by examining the chi-square, *CFI*, *TLI*, and *RMSEA* fit indices as well as the item factor loadings ( $> .40$ ) based on recommendations made by Jackson, Gillaspay, and Purc-Stephenson (2009). The factor structure was adequate unless otherwise noted.

**Job satisfaction.** Job satisfaction was measured using Cammann, Fichman, Jenkins and Klesh's (1983) 3-item scale from the Michigan Organizational Assessment Questionnaire. Bowling and Hammond (2008) conducted a meta-analysis providing reliability and construct

validity evidence for this measure of job satisfaction. An example item is “All in all I am satisfied with my job.” The scale displayed high internal consistency reliability ( $\alpha = .86$ ).

***Affective commitment.*** Affective commitment was measured via Allen and Meyer (1990)’s 8-item Affective Commitment Scale. An example item is “I would be very happy to spend the rest of my career with this organization.” The CFA indicated that one item had a factor loading of .38 and it was subsequently removed from analyses. The seven remaining items displayed high internal consistency reliability ( $\alpha = .88$ ).

***Engagement.*** Engagement was measured via the 9-item Utrecht Work Engagement Scale–9 (Schaufeli, Bakker, & Salanova, 2006) which includes three subscales measuring vigor, dedication, and absorption. An example item from the vigor subscale is “When I get up in the morning, I feel like going to work.” A CFA supported a 1-factor solution, and overall engagement was operationalized by averaging the responses to the three subscales. They displayed high internal consistency reliability ( $\alpha = .92$ ).

***Job performance.*** Job performance was measured via a 4-item scale developed by Abramis (1994) which measures self-reported technical job performance. The scale asks respondents to report on how well they handle responsibilities, make decisions, make mistakes, and get things done on time. An example item is “In the last week, how well were you handling the responsibilities and daily demands of your work?” Response options were on a scale from 1 (*very poorly*) to 5 (*very well*). The scale displayed high internal consistency reliability ( $\alpha = .84$ ).

***Leader effectiveness.*** Leadership effectiveness was measured using an adaptation of the single-item scale from the Leadership Versatility Index® (LVI; Kaplan & Kaiser, 2003), which asks participants to rate their manager’s overall effectiveness on a 10-point scale. Kaiser, Overfield, and Kaplan (2010) demonstrated the validity of this single-item measure. Participants

rated their leader's effectiveness on a scale from 1 (*very ineffective*) to 5 (*very effective*) instead of a 10-point scale, to remain consistent with the other follower outcome measures.

**Leader behavior.** Participants completed the following scales about their manager's behavior. Response options were on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*) unless otherwise noted. I conducted individual CFAs to confirm the single-factor structure of each scale, and the factor structure was adequate unless otherwise noted.

**Transformational leadership.** Participants rated their manager's transformational leadership behavior using Podsakoff, MacKenzie, Moorman, and Fetter's (1990) 23-item Transformational Leadership Inventory. An example item is "My manager has a clear understanding of where we are going." One item was dropped because the CFA indicated it had a factor loading of .31. The remaining 22 items displayed high internal consistency reliability ( $\alpha = .96$ ).

**Contingent reward leadership.** Participants rated their manager's contingent reward behavior using Podsakoff et al.'s (1984) 10-item contingent reward subscale from the Leader Reward and Punishment Questionnaire. An example item is "If I do well, I know my supervisor will reward me." The scale displayed high internal consistency reliability ( $\alpha = .93$ ).

**Destructive leadership.** Participants rated the destructive leadership behavior of their manager using a 16-item scale that was derived based on findings from Mullins (2015). Mullins conducted a factor analysis of the existing prominent destructive leadership scales. Based on the factor loadings reported by Mullins on a destructive leadership factor, interpretability, and non-repetitiveness, Young, Francavilla, and Andrews (2016) selected 16 items to utilize as a reduced destructive leadership scale. The scale consists of items from Tepper's (2000) abusive supervision scale and Ashforth's (1987, 1994) petty tyranny scale. Results of factor analyses

conducted by Young et al. and by Francavilla (2016) in a subsequent study provide evidence for the unidimensionality of the scale and show that it demonstrates high internal consistency reliability ( $\alpha = .96, .96$ ). An example item is “My manager reminds me of my past mistakes and failures.” Response options were on a frequency scale from 1 (*never*) to 5 (*always*). The scale displayed high internal consistency reliability ( $\alpha = .98$ ).

## **Results**

Table 3 displays the means, standard deviations, and correlations amongst all study variables. The following section outlines the analyses conducted to test Research Questions 1-3 as well as a set of supplemental analyses.

### **Research Question 1: Latent Profile Analysis**

Research Question 1 asks: *What unique patterns of leader-follower relationship characteristics exist in leader-follower dyads?* To determine the number and pattern of unique combinations of the leader-follower relationship characteristic variables that existed amongst respondents, I conducted an LPA on the five relationship characteristic variables (geographic distance, communication frequency, media richness, leader availability, and leader responsiveness). I examined a 1-, 2-, 3-, and 4-profile solution and assessed the Akaike’s Information Criterion (AIC), Bayesian Information Criterion (BIC), sample size adjusted BIC, Lo-Mendell-Rubin likelihood ratio test (LMRLRT), bootstrap likelihood ratio test (BLRT), entropy (i.e., distinctiveness between classes), and interpretability of the classes (Nylund, Asparouhov, & Muthén, 2007) to determine the number of profiles that best fit the data (see Table 4). I stopped at a 4-profile solution and did not test for 5 or more profiles because the *p*-value for the LMRLRT became non-significant for the 3- and 4-profile solutions. Additionally, in the 4-profile solution, only five participants fell into the fourth profile, and beyond the 2-

profile solution, the interpretability of class differences was difficult to determine as the third and fourth profile were not extremely distinguishable from other profiles.

Based on the criteria, I concluded that the results of the LPA supported a 2-profile solution. The LMRLRT had a significant  $p$ -value for the 2-profile solution, indicating that it fit the data better than a 1-profile solution. The LMRLRT was not significant when moving to a 3- or 4- profile solution, indicating that the 2-profile solution fit better. The BLRT  $p$ -value was significant for the 2-, 3-, and 4-profile solutions, supporting fit for any of these three solutions. Entropy was high for all three of these solutions, supporting fit for all three as well. The AIC, BIC, and sample adjusted BIC values decreased as number of profiles increased, indicating that the 4-profile solution fit best. However, research has shown that these information criteria can overestimate the number of profiles (Nylund et al., 2007). Finally, to consider interpretability, the means of the 2- and 3-profile solutions were graphed. The graphs indicated that the third profile was not markedly distinguishable from the second profile. Ultimately, based on the interpretability of the profiles as well as the significant LMRLRT  $p$ -value for the 2-profile solution, I concluded that the 2-profile solution fit the data optimally.

Figure 1 displays the standardized mean scores by profile. The graph indicates that geographic distance is the main differentiator for profile membership. Leader availability and responsiveness do not appear to distinguish the profiles. Profile 1 comprised 94% of the sample, and it was characterized by low geographic distance and slightly higher communication frequency and media richness than Profile 2. Profile 1 was labeled “Proximally Close Leaders.” Profile 2 comprised 6% of the sample, and it was characterized by high geographic distance and slightly lower communication frequency and media richness than Profile 1. It was labeled “Proximally Distant Leaders.”

## Research Question 2: Relationship Characteristics and Follower Outcomes

Research Question 2 asks: *How do characteristics of the leader-follower relationship (geographic distance, communication frequency, media richness, leader availability, leader responsiveness) relate to follower (a) job satisfaction, (b) affective commitment, (c) engagement, (d) job performance, and (e) leader effectiveness?* I investigated this question in three ways: (1) by examining the correlations between each relationship characteristic variable and each follower outcome variable, (2) by conducting relative weights analyses (Johnson, 2000) on the set of relationship characteristic variables on each of the outcome variables, and (3) by testing for differences in the follower outcome variables based on the latent profile membership determined from Research Question 1.

**Correlations.** Examination of the pairwise correlations of each relationship characteristic variable and each follower outcome (see Table 3) indicated that geographic distance did not significantly correlate with any of the follower outcomes. Communication frequency moderately correlated with four of the five follower outcomes ( $.15 < r < .19$ ), but it did not significantly correlate with engagement. Media richness was significantly and negatively correlated with engagement, but with a small effect size ( $r = -.09, p < .05$ ), and it was not significantly correlated with any of the other follower outcomes. Leader availability ( $.39 < r < .61$ ) and leader responsiveness ( $.34 < r < .52$ ) both displayed significant strong positive correlations with each of the follower outcomes.

**Relative weights analyses.** Relative weights analyses (Johnson, 2000) were conducted with each follower outcome variable as an outcome in turn, to examine the relative weights of the five relationship characteristic variables as predictors. For example, one relative weights analysis examined the relative weights of geographic distance, communication frequency, media

richness, leader availability, and leader responsiveness as predictors for job satisfaction, and a separate relative weights analysis examined these predictors on affective commitment, etc. See Table 5 for results. For all five relative weights analyses, geographic distance and media richness did not have significant relative weights compared to the other predictors. Job satisfaction and affective commitment displayed a similar pattern of results such that communication frequency, leader availability, and leader responsiveness had significant relative weights, with communication frequency explaining a much lower percentage of the variance (such as 4.75% for job satisfaction) compared to leader availability (61.07%) and leader responsiveness (33.54%). Follow-up tests for whether the predictors' weights significantly differed from one another indicated that both leader availability and leader responsiveness had significantly higher weights than communication frequency, and that leader availability had a significantly higher weight than leader responsiveness. For job performance as the outcome, the same three predictors' weights were significant, with communication frequency significantly lower than leader availability and leader responsiveness, but the weights for leader availability and responsiveness did not significantly differ from each other. For both engagement and leader effectiveness as the outcome, only leader availability and leader responsiveness had significant relative weights, with leader availability's weight significantly higher than leader responsiveness in both analyses.

**Profile differences.** Differences on the two profiles from the LPA were examined to determine whether relationship characteristic profile membership predicted any of the follower outcomes. Five paired *t*-tests were conducted to compare the mean values on each of the follower outcomes between the two profiles (see Table 6). None of the *t*-tests indicated a significant

difference between profiles on the follower outcomes ( $.39 < p < .92$ ). Figures 2-6 display boxplots of the follower outcomes by profile.

### **Research Question 3: Leader Behaviors, Relationship Characteristics, Follower Outcomes**

Research Question 3 asks: *Does leader-follower relationship profile (comprised of geographic distance, communication frequency, media richness, leader availability, and leader responsiveness) moderate the relationship between leadership behaviors (transformational, contingent reward, and destructive leadership) and follower outcomes (job satisfaction, affective commitment, engagement, job performance, and leader effectiveness)?* I investigated this question by examining relationship characteristic latent profile membership (identified in Research Question 1) as a moderator to the leader behavior-follower outcome relationship for each pair of leader behavior and follower outcome variables. I conducted a series of multiple regressions with the dichotomous latent profile membership variable, leader behavior (for example: transformational leadership), and their interaction as predictors of each follower outcome (for example: job satisfaction) in turn. I conducted fifteen regression analyses in total (see Table 7). To answer Research Question 3, I examined whether the interaction term between the profile membership variable and the leader behavior variable was significant. The interaction term was not significant in any of the regression analyses, indicating that profile membership did not moderate the relationship between leader behaviors and follower outcomes.

**Supplemental analyses.** Because the latent profiles were primarily defined by geographic distance, which did not display a relationship with any of the follower outcomes, I conducted a set of supplemental analyses to examine whether any of the three relationship characteristic variables that tended to have significant relationships with the follower outcomes moderated the leader behavior-follower outcome relationship. I examined communication

frequency, leader availability, and leader responsiveness in turn as moderators to each leader behavior and follower outcome pair, conducting 45 regression analyses in total. For each model, I examined whether the interaction term for the leader behavior variable and relationship characteristic variable was significant (see Tables 8-10). Several of the regression analyses had a significant interaction term. I probed for the nature of each interaction by plotting the simple slopes (see Figures 7-13).

Leader availability moderated the relationship between transformational leadership and affective commitment, job performance, and leader effectiveness, as well as the relationship between contingent reward leadership and job performance and leader effectiveness. Leader responsiveness displayed a similar pattern of results as a moderator. The nature of the interaction differed across follower outcomes. The positive relationship between transformational leadership and affective commitment was stronger when leader availability and responsiveness were high. The relationship between leader behavior (transformational or contingent reward) and job performance was positive when leader availability and responsiveness were high, but negative when they were low. For leader effectiveness, leader availability and responsiveness did not display a strong effect when leader behavior (transformational or contingent reward) was high, but when leader behavior was low, high availability and responsiveness positively related to leader effectiveness.

For destructive leadership, leader availability moderated the effect on leader effectiveness such that the negative effect of destructive leadership was stronger when leader availability was low. Leader responsiveness interacted with destructive leadership's effect on affective commitment such that leader responsiveness had a stronger positive effect on affective commitment when destructive leadership was low.

The interaction term for communication frequency and both transformational and contingent reward leadership was not significant for any follower outcome, but every interaction term was significant for destructive leadership. For all five outcome variables, there was a negative relationship between destructive leadership and the follower outcome when communication frequency was high, but the relationship was either neutral (job satisfaction, job performance, leader effectiveness) or positive (affective commitment, engagement) when communication frequency was low.

### **Discussion**

This study had three goals corresponding to the three research questions. Their results and implications are summarized below, followed by a discussion of their application in practice, study limitations, future research directions, and a summary of the study's contributions.

#### **Research Question 1 Summary and Interpretation**

Research Question 1 intended to examine the unique experiences of followers working in various situational contexts in relation to their leaders by determining the types of leader-follower relationship dynamics that exist, pertaining to followers' geographic distance from their leader, the richness of the media they use to communicate, the frequency with which they communicate, and the extent to which they perceive their leader to be available and responsive. The LPA indicated that two distinct profiles of relationship characteristics emerged from the data, with one profile characterized by followers who worked proximally close to their leader and perceived slightly higher media richness and communication frequency, and the other profile characterized by followers who worked at a distance from their leader and perceived slightly lower media richness and communication frequency. These results support the logic that working proximally close to a leader provides more opportunities to communicate as well as more

opportunities to have rich interactions, such as those that take place face-to-face. Leader availability and responsiveness were similar across the two profiles, indicating that they do not correspond to a leader's geographic distance from a follower.

### **Research Question 2 Summary and Interpretation**

The goal of Research Question 2 was to determine how aspects of the leader-follower relationship differentially relate to a follower's work experience, pertaining to job satisfaction, affective commitment, engagement, job performance, and perceived leader effectiveness. Results generally indicate that geographic distance and media richness are not important predictors of followers' job attitudes and performance, but rather a leader's attention (via communication frequency, availability, and responsiveness) is what matters most to followers.

**Geographic distance.** Geographic distance did not have a significant relationship with any of the follower outcomes. These results contribute to mixed findings on whether virtual leadership positively or negatively affects a follower's work experience. The null relationships between geographic distance and follower outcomes are contrary to previous findings that physical distance from a leader negatively affects follower outcomes (e.g., Joshi et al., 2009; Podsakoff et al., 1996) as well as findings that physical distance positively affects follower outcomes (e.g., Connaughton & Daly, 2004; Henderson, 2008). These results also contradict findings that distance can either positively or negatively moderate the effects of leader behaviors on follower outcomes (e.g., Gibson & Cohen, 2003; Orvis, 2004; Torres, 2018). These results do, however, partially support findings from Bonet and Salvador (2017) who found no main effect of leader distance on follower outcomes. Bonet and Salvador identified certain moderating circumstances (job complexity, isolation from other coworkers, and low managerial experience)

that can create a negative effect for distance on follower outcomes. The present study failed to identify additional moderating circumstances that create an effect of distance on followers.

**Media richness.** Media richness did not significantly correlate with four of the five outcomes and it did not have a significant relative weight when compared to the set of predictors on any of the outcomes, but it had a small negative correlation with follower engagement. These results contradict conventional wisdom that rich technology can enhance the interactive experience between two individuals. They also contradict previous findings that low media richness negatively affects a leaders' influence (Dulebohn & Hoch, 2017) and that high media richness positively impacts virtual team members' trust (Avolio et al., 2001). However, the results are consistent with Hambley et al.'s (2007) findings that media richness did not predict team performance.

**Communication frequency, leader availability, leader responsiveness.**

Communication frequency, leader availability, and leader responsiveness consistently surfaced as relevant predictors of the follower outcomes. Communication frequency displayed a significant positive correlation with every follower outcome besides engagement, and it had a significant but small relative weight predicting job satisfaction, affective commitment, and job performance. Leader availability and leader responsiveness both displayed strong positive correlations with the five outcome variables, and both displayed significant relative weights as predictors of each follower outcome. These findings taken with the findings that geographic distance and media richness generally did not predict the examined follower outcomes raise the question of whether *virtual leadership* should stand as its own construct. This study's results indicate that "good leadership" is "good leadership" regardless of the physical location of the leader-follower dyad or the technology they use to communicate. Thus, it may be unnecessary to

conceptualize *virtual leadership* as separate from *leadership*. The start of virtual leadership research coincided with the growth of the global economy and technology boom, during which time it made sense for virtual leadership to have its own category of literature. Today, however, technology and the virtuality of work have become so integrated in society that *virtual leadership* is arguably synonymous with *leadership*, as even collocated leader-follower dyads utilize virtual tools to communicate such as email and chat-based messaging. This study indicates that it is not the nature of working at a distance or using technology that affects followers, but rather the ways in which the leader sets up the interactive relationship, which is consistent with general leadership research (Barling et al., 2011). Moreover, virtual leadership research tends to identify behaviors such as mentoring, delegating, displaying empathy (Kayworth & Leidner, 2001), establishing trust (Malhotra et al., 2007), respect for diversity (Desper, 2014), and several other behaviors that are just “good leadership behaviors” as effective *virtual leadership* behaviors. The variables identified as effective virtual leader behaviors in this study also represent generally effective leader behaviors, with previous research showing that it is generally beneficial (regardless of context) to be available to followers (Brown, 2017), be responsive to followers (Shore, Sy, & Strauss, 2006), and communicate with them frequently (Gajendran & Joshi, 2012).

The results for leader availability, responsiveness, and communication frequency warrant additional implications. Leader availability and responsiveness tended to display stronger relationships with the follower outcomes than communication frequency, and they had stronger relative weights, indicating that if a leader cannot frequently communicate with his/her follower (due to different time zones, for example) finding ways to be available and responsive may compensate. Feeling they can reach their leader when needed seems to be more important to

followers than dyad communication frequency in general. Additionally, leader availability tended to have a stronger relative weight than responsiveness in predicting the outcomes, indicating that leaders' perceived approachability matters even more than whether they respond to their followers. However, perceptions of availability may be based largely on past experiences of leader responsiveness, though this was not examined in this study. Job performance was the only outcome for which leader availability and responsiveness did not have significantly different relative weights, which could be due to the fact that job performance is a task- rather than attitude-related outcome. These findings indicate that for followers to feel they can effectively perform their job, it is important that their leader is both available and responsive, but for followers to have positive job attitudes, it is more important that they perceive their leader is available than whether their leader is responsive. Perceived availability may have more to do with the leader's conveyed consideration for followers, while responsiveness may have more to do with a leader providing task-relevant information to followers. Finally, leader availability and responsiveness both displayed their strongest relationships with leader effectiveness, which is not surprising given the conceptual similarity of these three variables. The other follower outcomes are more distal to leader availability and responsiveness compared to leader effectiveness.

### **Research Question 3 Summary and Interpretation**

The goal of Research Question 3 was to examine whether aspects of the leader-follower relationship dynamic interacted with the effects of generally beneficial (transformational, contingent reward) and generally detrimental (destructive) leader behaviors on the follower outcomes. Results indicated that relationship characteristic profile membership did not moderate any of the effects of leader behavior on any of the follower outcomes. These findings were not surprising, given geographic distance was the main differentiator of the profiles and it did not

have a significant relationship with the outcome variables (nor the leader behaviors). Because communication frequency, leader availability, and leader responsiveness displayed significant relationships with the leader behaviors and follower outcomes, a set of supplemental analyses examined each of these variables as moderators, and many of these interactions were significant.

**Communication frequency as moderator.** For all five outcomes, the negative effect of destructive leadership was stronger when the leader-follower dyad communicated more frequently. This makes intuitive sense, as speaking frequently with a destructive leader provides more opportunities to be exposed to destructive leader behaviors. Additionally, when destructive leaders do not communicate frequently with their followers, follower outcomes remain high, especially for follower engagement. When destructive leaders are not communicating frequently, followers may find substitutes for leadership that positively contribute to their engagement, while not experiencing the negative impact of destructive leader behaviors.

**Leader availability and leader responsiveness as moderators.** The moderating effects of leader availability and responsiveness varied among the leader behaviors and follower outcomes.

**Destructive leadership.** The negative effect of destructive leadership on perceived leader effectiveness was stronger when leader availability was low, indicating that destructive leaders who are also not available are perceived as less effective. As for leader responsiveness as the moderator to destructive leadership's effect on affective commitment, results indicate that the optimal combination of destructive leadership and responsiveness is low destructive behaviors and high responsiveness, but when both destructive leadership and responsiveness are high, the level of affective commitment does not differ much from when responsiveness is low. These

findings indicate that more “attention” via responses to messages is not enough to offset or mitigate the negative effects of destructive leadership on affective commitment.

***Transformational and contingent reward leadership.*** The relationship between transformational leadership and affective commitment is strengthened when both leader availability and responsiveness are high. Transformational leadership and affective commitment consistently display a strong relationship (e.g., Ribeiro, Yucel, & Gomes, 2018), likely due to their similar nature related to emotional aspects of work. Engaging in behaviors that convey care for followers (availability and responsiveness) can make this relationship even stronger.

The results for job performance as the outcome differ slightly from those for affective commitment. The combination of high leader attention (via availability or responsiveness) and high transformational or contingent reward leader behaviors is beneficial for job performance, but when a leader is high on transformational or contingent reward leadership and then not available or responsive, job performance is negatively impacted. One interpretation of these results is that when transformational leaders set an ambitious and compelling vision for the future, but are then inaccessible, their followers feel that they cannot effectively perform their job. Similarly, leaders who set up a transactional leader-follower relationship by emphasizing reward and recognition in exchange for good work, who then are not reachable when followers are performing the work, are likely not engaging in much contingent reward behavior. Thus, followers will not know where they stand on performance or may even think they are performing poorly because they are not receiving recognition or praise.

For leader effectiveness as the outcome, transformational and contingent reward leadership both display a positive relationship regardless of leader availability and responsiveness, but leader availability and responsiveness seem to provide a buffer for

effectiveness when the leader behaviors are low. These findings indicate that the worst-case scenarios for perceived leader effectiveness are when a leader displays low transformational or contingent reward leader behaviors and also is not available or responsive. High levels of attention from a leader via availability and responsiveness can “make up” for low levels of transformational and contingent reward leadership, as perceived leader effectiveness remains relatively high when these behaviors are low but availability and responsiveness are high.

***Job satisfaction and engagement as outcomes.*** None of the interactions for leader availability and responsiveness paired with leader behaviors were significant for predicting job satisfaction or engagement. Engagement arguably represents an individual difference controlled by the follower rather than one that is easily influenced by aspects of the environment, and it may not be heavily influenced by interactions amongst the variables included in this study. The null results for job satisfaction are more difficult to explain, especially given its close relationship with affective commitment and the fact that job satisfaction displayed significant relationships with the set of other variables. Like engagement, perceiving high levels of attention from one’s manager did not make positive leader behaviors any more beneficial for job satisfaction. This set of null findings could be attributed to the strong direct relationship between leadership behaviors and job satisfaction. Perhaps the direct effects are so strong that the mild influence of the moderators do not make a difference (i.e., if a leader is transformational or transactional, job satisfaction increases regardless of other circumstances).

**Leader behaviors and virtual leadership.** An additional set of results worth noting that are not directly tied to a research question are those for the relationships amongst the leader behavior variables and geographic distance and media richness. There are several mixed findings as to whether virtual leadership enhances or augments a leader’s ability to engage in

transformational and transactional leader behaviors (e.g., Howell & Hall-Merenda, 1999; Howell et al., 2005; Purvanova & Bono, 2009). This study found no significant correlations between virtual leadership (i.e., geographic distance, media richness) and transformational or contingent reward leadership, indicating that distance and media choice have no direct connection to the extent to which a follower perceives his/her leader engages in these behaviors. These findings are contrary to arguments that it is more difficult to convey transformational and transactional leader behaviors at a distance or via technology (e.g., Hoch & Kozlowski, 2014; Howell & Hall-Merenda, 1999; Shuffler et al., 2016).

### **Implications for Practice**

The results of this study provide good news for companies leveraging virtual workers in various locations. The findings indicate that leader-follower distance alone does not make a leader less effective, nor does it make followers lower performers or less satisfied, engaged, or committed workers. Additionally, the richness of the technology that leader-follower dyads use to communicate generally does not impact a leaders' effectiveness nor a followers' work experience. The variables that do affect these outcomes, however, pertain to the way in which leaders set up their interactive relationship with followers, specifically around how frequently they communicate and how available and responsive they are. These findings indicate that companies may benefit from prioritizing leader development of soft skills over investing in technology for virtual leader-follower dyads because the mechanisms through which leaders interact with followers are less important than frequent communication, availability, and responsiveness. Instead of continuously updating technology as it rapidly changes, companies can focus on hiring and training leaders who are optimal communicators.

**Application recommendations.** Although the findings indicate that media richness does not influence follower outcomes, given its prominence in the workplace and the fact that it is engrained in work interactions, leader development programs should be relevant for use of technology. Additionally, being perceived as available over email may require different behaviors than being perceived as available via video conference, for example, and communication frequency, availability, and responsiveness likely look different across media types. This study examined leader-follower relationship characteristics across all media, but it may be the case that a leader who is perceived as available in general is engaging in different behaviors for each form of media to produce that perception. Thus, training on availability alone, or availability over email alone, is not the optimal approach. Additionally, the ideal degree of communication frequency will vary across followers. Training should emphasize identifying what each follower needs and prefers so that leaders can modify their communication style rather than using a one-size-fits-all approach.

In addition to hiring and training strong communicators, companies can incentivize positive leader-follower communication practices and seek ways to engrain their importance into company culture. Encouraging behaviors such as recurring leader-follower meetings and/or team meetings can provide a mechanism through which a leader can show attention to followers. Messaging about the importance of frequent touch points with followers and including the extent to which a leader connects with his/her team as part of a leader's performance evaluation can help communicate the importance of availability and responsiveness to leaders.

***Application for leaders.*** The findings from the set of supplemental analyses support the conclusion that leader attention can amplify the positive effects leaders have on their followers. For optimal follower job performance, the positive influence of transformational and contingent

reward leadership will only come to fruition when a leader is also available and responsive. Simply setting an exciting vision and motivating followers via transactional contingencies is not enough to enable strong job performance, as leaders must also make themselves accessible to their followers while they are completing the work. In fact, leader inaccessibility can be detrimental for job performance. Additionally, high levels of availability and responsiveness can make up for a leader not engaging in as many transformational or contingent reward leadership behaviors, when it comes to their followers' perceived leader effectiveness. These findings indicate that if leaders are unable to interact with followers frequently (and thus not able to engage in as many transformational or contingent reward behaviors), they can still be perceived as effective if they are accessible when needed. These results have implications for laissez-faire leaders who do not proactively reach out to followers: if they at least establish an open-door policy and respond when followers reach out, their followers will likely consider them effective.

***Boundary conditions on attention.*** Importantly, higher attention is not always better. The effects of attention will depend on a followers' needs and preferences for how often they would like to engage with their leader, and also depend on the behaviors in which the leader engages when the dyad interacts. More communication with destructive leaders is not better for followers, which highlights the fact that in addition to encouraging frequent communication, leader development programs should focus on encouraging positive leader behaviors such as transformational and contingent reward leadership.

Encouragement of higher leader attention has implications for leader burnout and well-being, and expectations for leaders to be available and responsive should be kept within reason. Heightened follower attention may be particularly challenging for leaders who work in different time zones from followers, especially if they have followers in several different locations.

Research shows that the burden of constant availability can negatively affect leaders' stress (Stokols et al., 2009) and lead to burnout (Avolio et al., 2014). There is also the possibility that heightened focus on leader availability and responsiveness can be detrimental for transformational and contingent reward behaviors. Rosen et al. (2018) found that high email demand led leaders to perceive they were not progressing toward their work goals, and in turn they engaged in less initiating structure and transformational leadership behaviors. These findings indicate that excessive availability and responsiveness to followers could become detrimental for leader job performance, and in turn follower job attitudes and performance. The burden of leader attention will increase with team headcount, as more followers will require more of a leader's time. Companies encouraging leaders to amplify their attention on followers should ensure that their number of followers is manageable, that expectations placed on leaders are reasonable (including their job remit beyond team leadership), and that training programs equip leaders to set boundaries on their time.

### **Limitations**

The main limitations of this study surround the generalizability of the sample and the operationalization of variables. These two categories are discussed in turn.

**Sample.** The sample for this study was restricted to workers based in the United States, which means the results may only generalize to US-based workers. Only two participants in the sample had leaders who worked in a different country, which limits the ability to generalize results to global companies in which workers are located in several different countries. There may have been restriction of range on the geographic distance variable, as there may exist effects of geographic distance at higher leader-follower distances (and across many time zones) which were not captured in this study. As a result, conclusions cannot generalize to leader-follower

dyads who work on opposite sides of the globe, such as in the United States and China. The geographic distance variable was also extremely skewed with the majority of the sample working in the same city as their manager. Because the sample included so many workers at a geographic distance of “0 miles”, it is possible that the nuanced effects of leader-follower distance were not captured. If a larger sample were collected that had higher representation of different leader-follower distances, effects of geographic distance may have been detected.

Additionally, the findings of this study may not hold under all work circumstances, as media richness and distance may operate differently to influence outcomes in different types of jobs. For example, there is evidence that technology influences work outcomes in complex jobs (Balthazard et al., 2012). Because this sample spread across industries and job types, it did not examine the relationships within highly complex or technical jobs, and examining these research questions within a sample of workers with high job complexity may have yielded different results. Additionally, these findings are specific to the general communication behaviors of leader-follower dyads. Technology may in fact influence the followers’ work experience, but only during certain leader-follower interactions, such as when they are speaking about task-related information or completing work together live via technology. Conversely, technology might be more influential in interpersonal interactions, such as during leader-follower coaching conversations. Finally, if technology is not important for leader-follower interactions, it may still be important for other work interactions, such as those between peer coworkers.

**Operationalizations.** The second set of study limitations surround the ways in which variables were operationalized. The first surrounds the operationalization of media richness, for which a score of 1 corresponded to face-to-face communication. Due to this scoring method, media richness and geographic distance were not completely distinct from each other and were

likely to share variance, which could have potentially contributed to why their relative weights were non-significant in predicting the outcome variables. However, geographic distance and media richness only correlated moderately ( $r = -.35$ ), indicating they captured different information, and when they were examined in turn via correlations with other variables, neither displayed significant relationships.

Additional limitations surround the geographic distance variable. First, it does not account for other factors that come with being at a distance, including time zone differences, language barriers, and cultural differences. The latter two differences were less likely in this sample given most leaders worked in the United States, although leaders still may have had different cultural backgrounds and primary languages from their followers. Failing to control for time zone differences may have contributed to why geographic distance displayed null relationships with other variables. However, it would have been difficult to accurately control for time zone because even if two individuals are in different time zones, it does not necessarily mean they do not work at the same time, as it is common for workers in the Eastern time zone to work later to coincide with Pacific time workers, for example. A better control for future research would be to account for the hours of overlap between a leader and follower's workday. One other limitation of the geographic distance variable is that leader-follower dyads who worked in the same primary city were coded in a different ordinal category than those who worked in cities at least one mile apart from each other. It is likely that some leader-follower dyads working in the same city worked more than one mile from each other, and the geographic distance coding may have misrepresented these nuances.

Another operationalization limitation surrounds the similarities amongst the several leadership variables examined in this study: leader availability, leader responsiveness, leader

effectiveness, transformational leadership, contingent reward leadership, and destructive leadership. The significant pairwise relationships and interactions amongst these variables may be due to their conceptual overlap and likelihood to share variance. As mentioned in the Method section, the distinctiveness between leader availability and responsiveness was examined before completing analyses. The distinctiveness between transformational and transactional (contingent reward) leadership has also been consistently evidenced in literature (e.g., Den Hartog, Van Muijen, & Koopman, 1997). Additionally, a CFA was conducted to test whether a factor structure with items loading on separate factors that correspond to their respective scales fit the data well, and results supported a factor solution corresponding to distinct leadership constructs.<sup>4</sup> Leader effectiveness could not be included in the CFA because it was a single-item measure, and its distinctiveness from the other leadership scales was examined via the correlation matrix. The correlation between leader effectiveness and each of the other five leadership variables ranged from  $-.38 < r < .75$ , and it is possible that some of the significant pairwise relationships and interactions from the supplemental analyses were due to, or inflated by, leader effectiveness's conceptual overlap with the other variables.

Other limitations regarding variable operationalization are that the survey included self-report measures of the follower outcomes, especially job performance, and that data were all single-source and collected at one time point. Participants' self-reported job performance ratings were likely inflated, and different relationships amongst variables may have been detected if leaders were included as raters of follower job performance or their own leadership behaviors,

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<sup>4</sup> For leader availability, leader responsiveness, transformational leadership, contingent reward leadership, and destructive leadership, a 5-factor solution fit the data well, with items loading above .40 on their respective factors and adequate fit indices,  $\chi^2(1529) = 6591.87, p = .00, CFI = .85, TLI = .85, RMSEA = .07 [.07, .08], SRMSR = .08$ . A CFA with all items loading onto a single factor fit the data poorly,  $\chi^2(1539) = 18922.42, p = .00, CFI = .49, TLI = .47, RMSEA = .14 [.13, .14], SRMSR = .17$ , and a chi-square difference test indicated that the 5-factor model fit the data significantly better than the 1-factor model,  $\chi^2(10) = 12,331, p < .01$ .

and if these data were collected at different time points. Finally, the leader responsiveness scale was developed for this study and its validity and reliability need to be further examined.

### **Future Research**

This study lends to several future research directions. First, more research can determine when, if ever, media richness influences work outcomes. Although media richness did not have a strong influence on the outcomes of leader-follower interactions in this study, there may be other work scenarios in which media richness plays a role. For example, media richness may be more important for coworker dyads working on a complex project together, or it may be more important for interpersonal conversations in which a coworker is giving negative feedback or when a leader is mentoring a follower. The effect of media richness could also be moderated by some individual difference amongst followers pertaining to their preferences for face-to-face versus virtual interactions. Because technology is continuously evolving, it will be important to continue examining the ways in which it affects how work is completed and how dyads interact.

While this study sought to examine virtual work holistically with a focus on leader-follower dyads, future research can look at a broader picture of virtual work by examining variables that were not included in this study. Specifically, future research can examine how other aspects of working at a distance from a leader, such as whether a worker is collocated with other coworkers and whether he/she works from home or another location (e.g., coffee shop or shared public workspace), affect follower outcomes such as satisfaction and performance. It is likely that other aspects of the work context contribute to the way in which virtual work affects followers, and the full picture of working virtually at a distance from one's leader may not have been captured in this study. Additionally, the follower outcome variables selected for this study likely do not capture the full follower work experience. Future research could examine the

effects of relationship characteristics and leader behaviors on other important follower outcomes, such as career advancement or well-being.

Additional research should examine when leader distance affects follower outcomes, if ever, by utilizing global samples. Conducting a study in a global company where leaders and followers work in different countries will provide more generalizable findings about how distance affects leader-follower dyads. To Bonet and Salvador's (2017) point, leader distance likely matters but only under certain circumstances, and more research is needed to determine under which circumstances, if any, distance can be detrimental. Perhaps when one works several thousands of miles from his/her leader, has high job complexity, is isolated from coworkers, and has a non-responsive leader, negative follower outcomes ensue.

Another avenue of future research could examine the appropriate cadence of leader availability, responsiveness, and communication frequency. The findings from this study imply that *more* of these variables is better, but that may not always be the case. Depending on the leader's team size, location, varying follower needs, and personal work priorities, expectations to be highly available and responsive may negatively affect a leader's well-being. More research is needed to understand how a leader can set boundaries to maintain strong job performance and well-being while engaging in highly interactive relationships with followers. Additionally, it may be the case that leader attention does not have a linear relationship with follower outcomes, but rather an inverted-U such that there reaches a point where a leader can be perceived as too attentive, which may hinder followers' task completion and also convey low trust in followers, in turn negatively affecting job attitudes. In sum, more research is needed to understand the optimal levels of leader attention for both leader and follower outcomes.

An additional area of research could examine the outcome variables from this study at the team level. While it was important to examine the leader-follower dyad because research on this area is limited, it may be the case that the effects of leader distance manifest at the team level. Additionally, the findings of this study should be replicated via other methodologies that do not include all single-source data. Utilizing manager job performance ratings rather than self-report data and turnover statistics rather than affective commitment ratings would expand understanding of how leader-follower dyad dynamics affect follower outcomes.

### **Contributions and Conclusion**

This study contributes to the literature on virtual leadership in several ways. First, it addressed the need to examine multiple aspects of the virtual work environment at once, as many studies tend to look at just geographic distance or just technology use as operationalizations of virtual leadership. The results indicate that leader availability, leader responsiveness, and communication frequency were much more influential on followers' work experiences than geographic distance and technology. The results also indicate that virtual leadership may not warrant its own category of research, as the behaviors identified as effective for virtual leaders are consistent with those typically found in general leadership research, and the aspects that are specific to virtual leadership (distance and media richness) no longer matter as they may once have when technology was more novel. Further research on the effects of distance at larger magnitudes may indicate there are certain circumstances under which it does affect a follower's work experience.

This study addressed the need to examine the influence of destructive leadership in virtual contexts. Distance and high media richness do not worsen the effects of destructive leadership, but communication frequency exacerbates its negative effects on follower job

satisfaction, affective commitment, engagement, job performance, and leader effectiveness. Similarly, the ways in which transformational and contingent reward leader behaviors influence followers depend on characteristics of how a leader-follower dyad communicates rather than their distance from each other or the media they use. In general, high transformational leadership and/or contingent reward leadership paired with high leader availability and/or responsiveness creates beneficial outcomes for followers.

This study also addressed the need to examine virtual leadership as experienced at the individual rather than team level and the sample of full-time workers supplements the body of virtual work research conducted on undergraduate samples. Additionally, this study did not simplify geographic distance or media richness, as these variables are often dichotomized as “collocated or not” and “relies on technology or not.” Geographic distance is also often measured by single items capturing followers’ perceptions of whether they typically work at the same address as their leader or approximately how far they tend to work from the leader. By collecting the primary cities in which leaders and followers work and computing the distance in miles, this study provides a more robust and objective measure of distance. Additionally, the use of SMEs to determine the media richness ratings provides an effective approach to assessing media richness that can be used in future studies as technology evolves. The scoring pattern for media richness from this study will likely change, depending on how technology develops, and utilizing SMEs at the time of a given study will allow for the most up-to-date richness ratings.

This study’s results provide good news for companies utilizing virtual workers. Companies can focus on hiring and training leaders who engage in effective communication behaviors by making themselves available, responsive, and communicating frequently, rather than investing in the latest technology for each leader-follower dyad. These results suggest that

money would be better spent with training on general leadership behaviors. Companies should remember that leader attention alone is not necessarily effective, as results of this study show that frequent communication with a destructive leader is determinantal for followers. Engaging in transformational leadership, contingent reward leadership, being available, being responsive, and communicating frequently are all positive behaviors that benefit collocated and distant followers alike. Companies can incentivize these types of behaviors, but it is also important to consider leader well-being and burnout given the burden of providing followers ample attention. A leader's headcount, location in comparison to his/her set of followers, and personal job remit are important to consider. Ensuring leaders have the mechanisms and bandwidth to engage frequently with their followers will equip those who are collocated and at a distance to create an optimal work environment for their followers.

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Table 1

*Survey Items*

Variable	Item
Geographic Distance	What is the primary city in which you work? What is the primary city in which your manager works?
Communication Frequency	How frequently does your manager initiate work-related interaction with you? How frequently do you initiate work-related interaction with your manager? How frequently do you interact with your manager at work? How frequently do you interact with your manager informally or socially at work?
Media Richness	Please indicate the proportion of your total time spent communicating with your manager that is done over each medium. Your responses for all media must sum to 100. Face-to-face communication Video call (via Webex, Skype, telepresence, FaceTime, etc.) Phone call (direct phone call or computer-mediated phone call with <b>no video</b> such as Webex or Skype call) Collaboration tool message (such as Slack, Microsoft Teams, Webex Teams, Facebook Workplace, Fleep, etc.) Text-based chat or instant message (via text message, iMessage, or a text-based instant messaging tool that is <b>not</b> a Collaboration tool) Email Fax
Leader Availability	My manager... actively communicates his/her availability to meet with me keeps an "open-door" policy for meeting with me as needed responds positively and quickly to my requests to meet welcomes unscheduled conversations with me is too busy to meet with me most of the time* (R) tells me he/she is too busy to meet* (R) is unavailable to meet with me* (R)
Leader Responsiveness	When I send my manager a message, I know he/she will respond My manager ignores my emails* (R) When I reach out to my manager, he/she always responds If I send my manager a message, I always receive a response My manager doesn't always get back to me* (R) My manager doesn't usually respond to my messages* (R) My manager ignores my phone calls* (R) When I leave my manager a voicemail, I know he/she will call me back When I call my manager, he/she usually picks up
Job Satisfaction	All in all, I am satisfied with my job In general, I like working here In general, I don't like my job (R)
Affective Commitment	I would be very happy to spend the rest of my career with this organization I enjoy discussing my organization with people outside it

Table 1

*(continued)*

	<p>I really feel as if this organization's problems are my own</p> <p>I think that I could easily become as attached to another organization as I am to this one* (R)</p> <p>I do not feel like "part of the family" at my organization (R)</p> <p>I do not feel "emotionally attached" to this organization (R)</p> <p>This organization has a great deal of personal meaning for me</p> <p>I do not feel a <i>strong</i> sense of belonging to <i>my</i> organization (R)</p>
Engagement	<p>At my work, I feel bursting with energy</p> <p>At my job, I feel strong and vigorous</p> <p>When I get up in the morning, I feel like going to work</p> <p>I am enthusiastic about my job</p> <p>My job inspires me</p> <p>I am proud of the work that I do</p> <p>I feel happy when I am working intensely</p> <p>I am immersed in my work</p> <p>I get carried away when I'm working</p>
Job Performance	<p>In the last week you worked, how well were you...          handling the responsibilities and daily demands of your work?          making the right decisions?          performing without mistakes?          getting things done on time?</p>
Leader Effectiveness	<p>How would you rate your manager's overall effectiveness?</p>
Transformational Leadership	<p>Below is a set of statements that may or may not describe your manager's behavior at work. Please indicate the extent to which you agree that each statement is descriptive of your manager.</p> <p>My manager...</p> <p>has a clear understanding of where we are going</p> <p>paints an interesting picture of the future for our group</p> <p>is always seeking new opportunities for the organization</p> <p>inspires others with his/her plans for the future</p> <p>is able to get others committed to his/her dream of the future</p> <p>leads by "doing," rather than simply by "telling"</p> <p>provides a good model for me to follow</p> <p>leads by example</p> <p>fosters collaboration among work groups</p> <p>encourages employees to be "team players"</p> <p>gets the group to work together for the same goal</p> <p>develops a team attitude and spirit among his/her employees</p> <p>shows us that he/she expects a lot from us</p> <p>insists on only the best performance</p> <p>will not settle for second best</p> <p>acts without considering my feelings (R)</p> <p>shows respect for my personal feelings</p> <p>behaves in a manner thoughtful of my personal needs</p> <p>treats me without considering my personal feelings* (R)</p>

Table 1

*(continued)*

	<p>challenges me to think about old problems in new ways</p> <p>asks questions that prompt me to think</p> <p>has stimulated me to rethink the way I do things</p> <p>has ideas that have challenged me to reexamine some of my basic assumptions about my work</p>
Contingent Reward Leadership	<p>My manager always gives me positive feedback when I perform well</p> <p>My manager gives me special recognition when my work performance is especially good</p> <p>My manager would quickly acknowledge an improvement in the quality of my work</p> <p>My manager commends me when I do a better than average job</p> <p>My manager personally pays me a compliment when I do outstanding work</p> <p>My manager informs his/her boss and/or others in the organization when I do outstanding work</p> <p>If I do well, I know my manager will reward me</p> <p>My manager would do all that he/she could to help me go as far as I would like to go in this organization if my work was consistently above average</p> <p>My good performance often goes unacknowledged by my manager (R)</p> <p>I often perform well in my job and still receive no praise from my manager (R)</p>
Destructive Leadership	<p>Please indicate the frequency with which your manager engages in the following behaviors.</p> <p>My manager...</p> <p>belittles or embarrasses subordinates</p> <p>puts me down in front of others</p> <p>criticizes subordinates in front of others</p> <p>expresses anger at me when he/she is mad for another reason</p> <p>treats subordinates in a condescending or patronizing manner</p> <p>reminds me of my past mistakes and failures</p> <p>criticizes subordinates about personal matters</p> <p>makes negative comments about me to others</p> <p>loses his/her temper</p> <p>tells me my thoughts or feelings are stupid</p> <p>invades my privacy</p> <p>uses authority or position for personal gain</p> <p>exaggerates the size of subordinate's errors and weaknesses</p> <p>tells me I'm incompetent</p> <p>is often displeased with my work for no apparent reason</p> <p>holds me accountable for things I have no control over</p>

*Note.* (R) indicates reverse-coded item. \* indicates item was removed from analyses.

Table 2

*Tukey Honest Significant Difference Tests for SME Media Richness Ratings*

Variables	<i>d</i>	<i>CI</i>	<i>p adj</i>
Email-Collab	-.42	(-1.21, .37)	.68
F2f-Collab	2.50	(1.71, 3.29)	.00
Fax-Collab	-1.50	(-2.29, -.71)	.00
Phone-Collab	.58	(-.21, 1.37)	.29
Text-Collab	-.33	(-1.12, .46)	.86
Video-Collab	1.58	(.79, 2.37)	.00
F2f-Email	2.92	(2.13, 3.71)	.00
Fax-Email	-1.08	(-1.87, -.29)	.00
Phone-Email	1.00	(.21, 1.79)	.00
Text-Email	.08	(-.71, .87)	1.00
Video-Email	2.00	(1.21, 2.79)	.00
Fax-F2f	-4.00	(-4.79, -3.21)	.00
Phone-F2f	-1.92	(-2.71, -1.13)	.00
Text-F2f	-2.83	(-3.62, -2.04)	.00
Video-F2f	-.92	(-1.71, -.13)	.01
Phone-Fax	2.08	(1.29, 2.87)	.00
Text-Fax	1.17	(.38, 1.96)	.00
Video-Fax	3.08	(2.29, 3.87)	.00
Text-Phone	-.92	(-1.71, -.13)	.01
Video-Phone	1.00	(.21, 1.79)	.00
Video-Text	1.92	(1.13, 2.71)	.00

*Note.* F2f = Face-to-face communication, Collab = Collaboration tool message.

Table 3

*Means, Standard Deviations, Cronbach's Alpha, and Correlations of Study Variables*

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>
1. Geographic Distance	1.27	.90	(NA)												
2. Communication Frequency	5.15	1.31	-.13**	(.84)											
3. Media Richness	3.73	.86	-.35***	.42***	(NA)										
4. Leader Availability	4.05	.76	.03	.31***	.11**	(.84)									
5. Leader Responsiveness	4.11	.73	-.01	.28***	.09*	.76***	(.87)								
6. Job Satisfaction	3.80	.97	.01	.18***	.02	.53***	.45***	(.86)							
7. Affective Commitment	3.32	.95	.00	.17***	.02	.48***	.42***	.77***	(.88)						
8. Engagement	3.50	.88	-.01	.08	-.09*	.42***	.34***	.68***	.74***	(.92)					
9. Job Performance	4.06	.66	.03	.15***	-.03	.39***	.40***	.35***	.28***	.35***	(.84)				
10. Leader Effectiveness	4.00	1.05	.04	.19***	.03	.61***	.52***	.57***	.51***	.46***	.31***	(NA)			
11. Transformational Leadership	3.70	.79	.05	.21***	.01	.70***	.59***	.68***	.65***	.64***	.36***	.75***	(.96)		
12. Contingent Reward Leadership	3.55	.91	.05	.23***	.04	.64***	.52***	.61***	.60***	.54***	.30***	.66***	.80***	(.93)	
13. Destructive Leadership	1.75	1.03	-.07	-.21***	-.16***	-.43***	-.38***	-.43***	-.30***	-.07	-.20***	-.38***	-.36***	-.40***	(.98)

*Note.* Values on the diagonal are Cronbach's alpha. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4

*Latent Profile Analysis Model Fit Summary*

<i>Model</i>	<i>LL</i>	<i>Param</i>	<i>AIC</i>	<i>BIC</i>	<i>Adj. BIC</i>	<i>LMRLRT</i>	<i>p<sub>LMRLRT</sub></i>	<i>BLRT</i>	<i>p<sub>BLRT</sub></i>	<i>Entropy</i>
1 Profile	-3987.80	10	7995.60	8039.81	8008.06	NA	NA	NA	NA	NA
2 Profiles	-3369.27	16	6770.54	6841.28	6790.48	1205.77	.01	1237.06	.00	.99
3 Profiles	-2871.97	22	5787.93	5885.21	5815.36	969.44	.44	994.60	.00	.99
4 Profiles	-2529.58	28	5115.16	5238.96	5150.07	669.88	.78	684.78	.00	.99

*Note.* LL = Loglikelihood, Param = Parameters. AIC = Akaike's Information Criterion, BIC = Bayesian Information Criterion, LMRLRT = Lo-Mendell-Rubin Likelihood Ratio Test, BLRT = bootstrapped likelihood ratio test.

Table 5

*Relative Weights Analyses for the Set of Relationship Characteristic Variables as Predictors on Each Follower Outcome*

Outcome Variable ( $R^2$ )	Predictor	Raw RW	Rescaled RW	CI Value	CI Sig	Predictor Comparisons		
Job Satisfaction (.28)	Geographic Distance	.00	.07	(.00, .00)	(-.01, .00)	Geographic Distance	Comm Frequency (-.03, -.004)	L Availability (-.23, -.13)
	Comm Frequency	.01	4.75	(.00, .03)	(.00, .03)	Media Richness	(-.03, -.001)	(-.23, -.12)
	Media Richness	.00	.58	(.00, .01)	(-.01, .01)	L Availability	(.11, .22)	
	L Availability	.17	61.07	(.12, .23)	(.12, .23)	L Responsiveness	(.04, .12)	(-.13, -.03)
	L Responsiveness	.10	33.54	(.06, .13)	(.06, .13)			
Affective Commitment (.24)	Geographic Distance	.00	.09	(.00, .00)	(-.01, .00)	Geographic Distance	Comm Frequency (-.03, -.003)	L Availability (-.19, -.10)
	Comm Frequency	.01	5.36	(.00, .03)	(.00, .03)	Media Richness	(-.03, -.002)	(-.19, -.10)
	Media Richness	.00	.48	(.00, .00)	(-.01, .01)	L Availability	(.08, .17)	
	L Availability	.14	57.78	(.10, .19)	(.10, .19)	L Responsiveness	(.04, .11)	(-.10, -.01)
	L Responsiveness	.09	36.30	(.06, .12)	(.06, .12)			
Engagement (.20)	Geographic Distance	.00	.89	(.00, .01)	(-.02, .00)	Geographic Distance	L Availability (-.17, -.08)	
	Comm Frequency	.00	2.50	(.00, .01)	(-.02, .01)	Comm Frequency	(-.17, -.07)	
	Media Richness	.01	7.09	(.00, .04)	(-.01, .03)	Media Richness	(-.16, -.06)	
	L Availability	.12	60.60	(.08, .17)	(.07, .17)	L Responsiveness	(-.11, -.02)	
	L Responsiveness	.06	28.92	(.03, .09)	(.02, .09)			
Job Performance (.18)	Geographic Distance	.00	.19	(.00, .00)	(-.004, .01)	Geographic Distance	Comm Frequency (-.03, -.002)	L Availability (-.13, -.05)
	Comm Frequency	.01	5.99	(.00, .03)	(.00, .03)	Media Richness	(-.03, .01)	(-.12, -.04)
	Media Richness	.00	2.51	(.00, .02)	(-.001, .02)	L Availability	(.03, .11)	
	L Availability	.08	43.57	(.05, .12)	(.04, .13)	L Responsiveness	(.04, .12)	(-.04, .05)
	L Responsiveness	.09	47.74	(.05, .13)	(.05, .13)			
Leader Effectiveness (.38)	Geographic Distance	.00	.25	(.00, .01)	(-.02, .00)	Geographic Distance	L Availability (-.29, -.18)	
	Comm Frequency	.01	3.61	(.01, .03)	(-.002, .03)	Comm Frequency	(-.27, -.16)	
	Media Richness	.00	.31	(.00, .00)	(-.02, .00)	Media Richness	(-.29, -.18)	
	L Availability	.23	60.01	(.18, .28)	(.17, .28)	L Responsiveness	(-.16, -.03)	
	L Responsiveness	.14	35.82	(.10, .18)	(.10, .18)			

*Note.* RW = Relative Weight, CI = Confidence Interval. CI Sig = Confidence Interval Significance Level. Predictor Comparisons computed by selecting 1 predictor and comparing to all other predictors. Only predictors with significant relative weights were selected to compare to others. CI Sig not containing zero indicates significance.

Table 6

*T-tests for Profile Membership Differences on Follower Outcomes*

Outcome		<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>CI</i>
Job Satisfaction				.10	40	.92	(-.30, .33)
	Proximally Close Leaders	3.80	.98				
	Proximally Distant Leaders	3.79	.91				
Affective Commitment				.20	39	.81	(-.32, .40)
	Proximally Close Leaders	3.33	.95				
	Proximally Distant Leaders	3.29	1.03				
Engagement				.50	41	.60	(-.19, .34)
	Proximally Close Leaders	3.51	.88				
	Proximally Distant Leaders	3.44	.76				
Job Performance				-.90	41	.39	(-.29, .11)
	Proximally Close Leaders	4.05	.67				
	Proximally Distant Leaders	4.14	.57				
Leader Effectiveness				-.80	41	.44	(-.45, .20)
	Proximally Close Leaders	3.99	1.06				
	Proximally Distant Leaders	4.11	.92				

*Note.*  $N_{\text{Proximally Close Leaders}} = 579$ ,  $N_{\text{Proximally Distant Leaders}} = 36$ .

Table 7

*Regression Analyses for Leader Behavior, Relationship Characteristic Profile, and their**Interaction on Follower Outcome*

	Transformational Leadership				Contingent Reward Leadership				Destructive Leadership			
<b>Job Satisfaction</b>												
Adj. $R^2$	.46				.37				.19			
$F(p)$	178.4 (.00)				120.2 (.00)				47.5 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.74	.14	5.29	.00	1.50	.13	11.66	.00	4.53	.07	62.90	.00
Class	-.85	.73	-1.16	.25	-.52	.62	-.84	.40	-.18	.32	-.56	.57
Leadership	.83	.04	22.47	.00	.65	.04	18.39	.00	-.41	.04	-11.75	.00
Class*L	.19	.19	.99	.33	.12	.17	.72	.47	.04	.18	.19	.85
<b>Affective Commitment</b>												
Adj. $R^2$	.43				.36				.09			
$F(p)$	153.5 (.00)				116.3 (.00)				21.15 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.47	.14	3.27	.00	1.10	.13	8.66	.00	3.84	.07	51.37	.00
Class	-1.44	.74	-1.94	.05	-.68	.61	-1.12	.26	-.59	.33	-1.78	.08
Leadership	.77	.04	20.63	.00	.63	.03	18.01	.00	-.29	.04	-7.96	.00
Class*L	.34	.19	1.76	.08	.16	.16	.97	.33	.31	.19	1.63	.10
<b>Engagement</b>												
Adj. $R^2$	.41				.29				.00			
$F(p)$	142.9 (.00)				83.37 (.00)				1.08			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.91	.13	6.87	.00	1.69	.12	13.71	.00	3.62	.07	50.26	.00
Class	-.65	.69	-.93	.35	-.78	.59	-1.32	.19	-.20	.32	-.65	.52
Leadership	.70	.03	20.15	.00	.51	.03	15.16	.00	-.06	.04	-1.74	.08
Class*L	.12	.18	.69	.49	.18	.16	1.14	.26	.08	.18	.43	.67
<b>Job Performance</b>												
Adj. $R^2$	.12				.08				.04			
$F(p)$	29.44 (.00)				19.76 (.00)				8.89 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	2.97	.12	24.43	.00	3.27	.11	30.99	.00	4.28	.05	80.31	.00
Class	-.13	.64	-.20	.84	.40	.50	.79	.43	.12	.23	.53	.60
Leadership	.29	.03	9.12	.00	.22	.03	7.60	.00	-.13	.03	-4.93	.00
Class*L	.05	.16	.28	.78	-.09	.14	-.68	.50	-.05	.14	-.34	.73
<b>Leader Effectiveness</b>												
Adj. $R^2$	.56				.43				.14			
$F(p)$	262.5 (.00)				156.6 (.00)				33.73 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.33	.14	2.43	.02	1.27	.13	9.56	.00	4.68	.08	58.31	.00
Class	-.56	.72	-.78	.43	.20	.63	.32	.75	-.30	.35	-.85	.40
Leadership	.99	.04	27.34	.00	.77	.04	21.21	.00	-.39	.04	-9.99	.00
Class*L	.14	.19	.77	.44	-.04	.17	-.25	.80	.21	.21	1.04	.30

*Note.* Class = Relationship characteristic profile membership, Class\*L = Interaction between relationship characteristic profile membership and given leadership behavior variable.

Table 8

*Supplemental Regression Analyses for Leader Behavior, Leader Availability, and their**Interaction on Follower Outcome*

	Transformational Leadership				Contingent Reward Leadership				Destructive Leadership			
<b>Job Satisfaction</b>												
Adj. $R^2$	.47				.40				.33			
$F(p)$	181.4 (.00)				137.9 (.00)				102.1 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.88	.52	1.69	.09	.81	.47	1.72	.09	1.90	.39	4.89	.00
LA	.04	.14	.26	.80	.31	.12	2.49	.01	.57	.09	6.31	.00
Leadership	.63	.16	3.85	.00	.50	.15	3.24	.00	-.18	.16	-1.14	.26
LA*L	.03	.04	.78	.44	.00	.04	-.05	.96	-.02	.04	-.41	.68
<b>Affective Commitment</b>												
Adj. $R^2$	.43				.38				.24			
$F(p)$	155.6 (.00)				124.5 (.00)				65.42			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$B$	SE	$t$	$p$
Intercept	1.65	.53	3.12	.00	1.33	.47	2.84	.00	.89	.41	2.19	.03
LA	-.28	.14	-2.01	.04	.02	.12	.19	.85	.65	.09	6.81	.00
Leadership	.33	.17	2.01	.05	.29	.15	1.92	.06	.10	.16	.60	.55
LA*L	.10	.04	2.63	.01	.06	.04	1.57	.12	-.05	.04	-1.29	.20
<b>Engagement</b>												
Adj. $R^2$	.41				.30				.19			
$F(p)$	144.0 (.00)				87.1 (.00)				48.3 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	1.82	.49	3.69	.00	1.89	.46	4.12	.00	.97	.39	2.50	.01
LA	-.28	.13	-2.11	.04	.01	.12	.07	.95	.58	.09	6.39	.00
Leadership	.49	.15	3.16	.00	.26	.15	1.71	.09	.16	.16	1.04	.30
LA*L	.07	.04	1.78	.08	.05	.04	1.28	.20	-.01	.04	-.29	.77
<b>Job Performance</b>												
Adj. $R^2$	.21				.20				.15			
$F(p)$	55.81				50.88 (.00)				37.61 (.00)			
	$B$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	5.10	.43	11.89	.00	4.65	.37	12.57	.00	2.55	.30	8.55	.00
LA	-.41	.11	-3.60	.00	-.22	.10	-2.21	.03	.39	.07	5.54	.00
Leadership	-.66	.13	-4.89	.00	-.61	.12	-5.07	.00	.09	.12	.75	.45
LA*L	.20	.03	6.19	.00	.17	.03	5.77	.00	-.03	.03	-1.02	.31
<b>Leader Effectiveness</b>												
Adj. $R^2$	.59				.50				.39			
$F(p)$	293.0 (.00)				206.4 (.00)				129.6 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	-2.19	.49	-4.42	.00	-1.27	.46	-2.75	.01	1.88	.40	4.65	.00
LA	.78	.13	5.91	.00	.85	.12	6.91	.00	.59	.09	6.24	.00
Leadership	1.52	.15	9.79	.00	1.07	.15	7.10	.00	-.48	.16	-2.97	.00
LA*L	-.17	.04	-4.56	.00	-.13	.04	-3.73	.00	.09	.04	2.12	.03

*Note.* LA = Leader availability, LA\*L = Interaction between leader availability and given leadership behavior variable.

Table 9

*Supplemental Regression Analyses for Leader Behavior, Leader Responsiveness, and their Interaction on Follower Outcome*

	Transformational Leadership				Contingent Reward Leadership				Destructive Leadership			
<b>Job Satisfaction</b>												
Adj. $R^2$	.47				.39				.28			
$F(p)$	179.8 (.00)				133.4 (.00)				81.13 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.71	.61	1.15	.25	.71	.54	1.31	.19	2.26	.43	5.23	.00
LR	.05	.15	.32	.75	.28	.13	2.05	.04	.50	.10	4.95	.00
Leadership	.72	.19	3.83	.00	.59	.17	3.42	.00	-.18	.19	-.93	.36
LR*L	.02	.04	.36	.72	-.01	.04	-.23	.82	-.03	.05	-.62	.54
<b>Affective Commitment</b>												
Adj. $R^2$	.43				.38				.20			
$F(p)$	155.1 (.00)				125.1 (.00)				52.29 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	1.63	.62	2.62	.01	1.36	.54	2.51	.01	.93	.45	2.08	.04
LR	-.26	.15	-1.70	.09	.00	.13	.00	1.00	.65	.10	6.20	.00
Leadership	.33	.19	1.71	.09	.29	.17	1.71	.09	.23	.20	1.18	.24
LR*L	.10	.04	2.28	.02	.06	.04	1.56	.12	-.10	.05	-1.99	.047
<b>Engagement</b>												
Adj. $R^2$	.41				.29				.12			
$F(p)$	142.8 (.00)				84.4 (.00)				27.61 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	1.29	.58	2.23	.03	1.34	.53	2.52	.01	1.32	.43	3.07	.00
LR	-.13	.14	-.92	.36	.12	.13	.88	.38	.50	.10	5.01	.00
Leadership	.66	.18	3.74	.00	.50	.17	2.95	.00	.20	.19	1.07	.28
LR*L	.02	.04	.47	.64	.00	.04	-.12	.91	-.04	.05	-.77	.44
<b>Job Performance</b>												
Adj. $R^2$	.21				.20				.16			
$F(p)$	54.53 (.00)				50.85 (.00)				39.69 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	4.73	.51	9.33	.00	4.38	.43	10.31	.00	2.70	.32	8.50	.00
LR	-.31	.13	-2.44	.01	-.16	.11	-1.51	.13	.35	.07	4.68	.00
Leadership	-.57	.16	-3.65	.00	-.53	.13	-3.93	.00	-.03	.14	-.19	.85
LR*L	.17	.04	4.77	.00	.15	.03	4.71	.00	.00	.03	-.10	.92
<b>Leader Effectiveness</b>												
Adj. $R^2$	.58				.48				.31			
$F(p)$	283.5 (.00)				191.8 (.00)				91.74			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	-2.18	.59	-3.70	.00	-1.04	.54	-1.92	.06	2.33	.46	5.07	.00
LR	.70	.15	4.75	.00	.69	.13	5.14	.00	.50	.11	4.64	.00
Leadership	1.56	.18	8.66	.00	1.07	.17	6.22	.00	-.51	.20	-2.51	.01
LR*L	-.16	.04	-3.76	.00	-.11	.04	-2.70	.01	.07	.05	1.48	.14

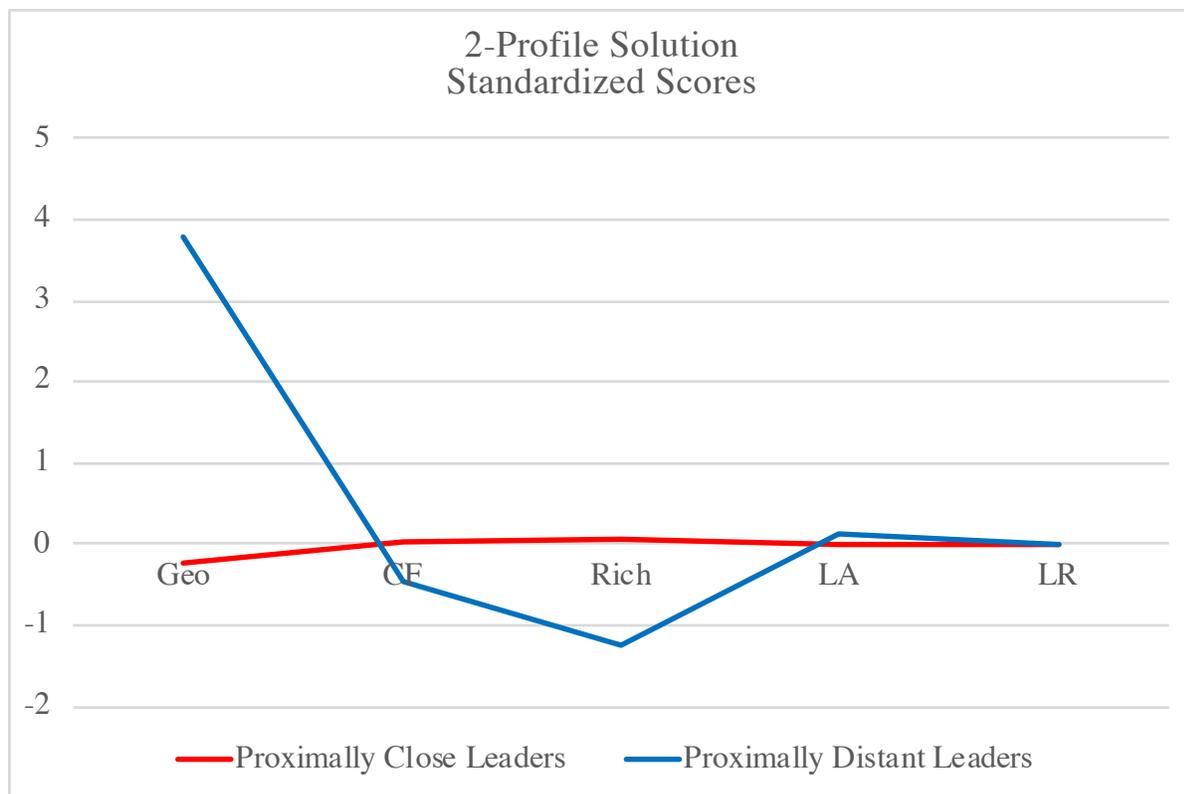
Note. LR = Leader responsiveness, LR\*L = Interaction between leader responsiveness and given leadership behavior variable.

Table 10

*Supplemental Regression Analyses for Leader Behavior, Communication Frequency, and their Interaction on Follower Outcome*

	Transformational Leadership				Contingent Reward Leadership				Destructive Leadership			
<b>Job Satisfaction</b>												
Adj. $R^2$	.47				.37				.21			
$F(p)$	180.4 (.00)				121.1 (.00)				56.58 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	1.44	.50	2.91	.00	1.62	.50	3.25	.00	3.23	.28	11.61	.00
CF	-.14	.10	-1.44	.15	-.02	.10	-.19	.85	.25	.05	4.78	.00
Leadership	.59	.14	4.33	.00	.56	.14	3.95	.00	.09	.12	.71	.48
CF*L	.05	.03	1.83	.07	.02	.03	.60	.55	-.10	.02	-4.02	.00
<b>Affective Commitment</b>												
Adj. $R^2$	.43				.36				.12			
$F(p)$	153.2 (.00)				116.3 (.00)				29.3 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	1.05	.51	2.08	.04	.78	.49	1.59	.11	2.40	.29	8.31	.00
CF	-.12	.10	-1.21	.23	.06	.09	.68	.50	.27	.05	5.03	.00
Leadership	.57	.14	4.12	.00	.67	.14	4.82	.00	.25	.13	1.94	.05
CF*L	.04	.03	1.55	.12	-.01	.03	-.37	.71	-.10	.03	-4.08	.00
<b>Engagement</b>												
Adj. $R^2$	.41				.29				.04			
$F(p)$	143.4 (.00)				83.52 (.00)				9.72 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	.82	.47	1.74	.08	1.36	.48	2.85	.00	2.28	.28	8.23	.00
CF	.00	.09	.04	.96	.05	.09	.57	.57	.26	.05	5.00	.00
Leadership	.78	.13	6.08	.00	.65	.14	4.80	.00	.53	.12	4.31	.00
CF*L	-.01	.02	-.49	.63	-.02	.03	-.93	.35	-.12	.02	-4.86	.00
<b>Job Performance</b>												
Adj. $R^2$	.13				.09				.06			
$F(p)$	31.62 (.00)				21.25 (.00)				12.87 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	3.40	.43	7.87	.00	3.35	.41	8.23	.00	3.63	.21	17.46	.00
CF	-.08	.08	-.93	.35	.00	.08	-.02	.98	.13	.04	3.23	.00
Leadership	.12	.12	1.02	.31	.14	.12	1.17	.24	.07	.09	.80	.42
CF*L	.03	.02	1.44	.15	.01	.02	.59	.55	-.04	.02	-2.14	.03
<b>Leader Effectiveness</b>												
Adj. $R^2$	.57				.44				.06			
$F(p)$	265.2 (.00)				158.7 (.00)				40.67 (.00)			
	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$	$\beta$	SE	$t$	$p$
Intercept	-.56	.49	-1.14	.25	.44	.51	.86	.39	3.37	.31	10.82	.00
CF	.18	.09	1.90	.06	.17	.10	1.75	.08	.25	.06	4.28	.00
Leadership	1.20	.13	9.05	.00	.96	.14	6.63	.00	.07	.14	.51	.61
CF*L	-.04	.02	-1.67	.09	-.04	.03	-1.47	.14	-.09	.03	-3.23	.00

Note. CF = Communication frequency, CF\*L = Interaction between communication frequency and given leadership behavior variable.



*Figure 1.* Latent Profile Analysis Results: Standardized Mean Scores by Profile. Geo = Geographic distance, CF = Communication frequency, Rich = Media Richness, LA = Leader availability, LR = Leader responsiveness.

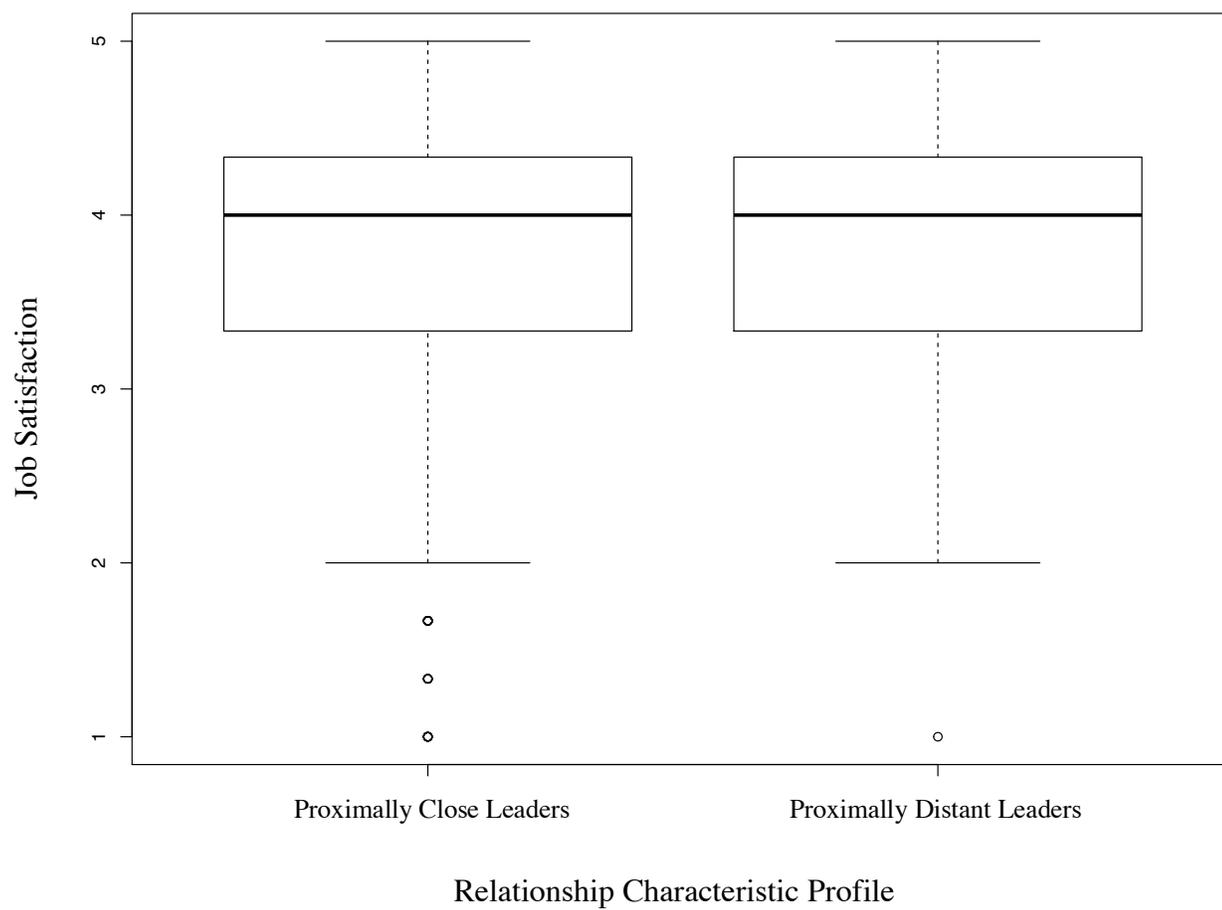


Figure 2. Boxplots of Job Satisfaction by Relationship Characteristic Profile.

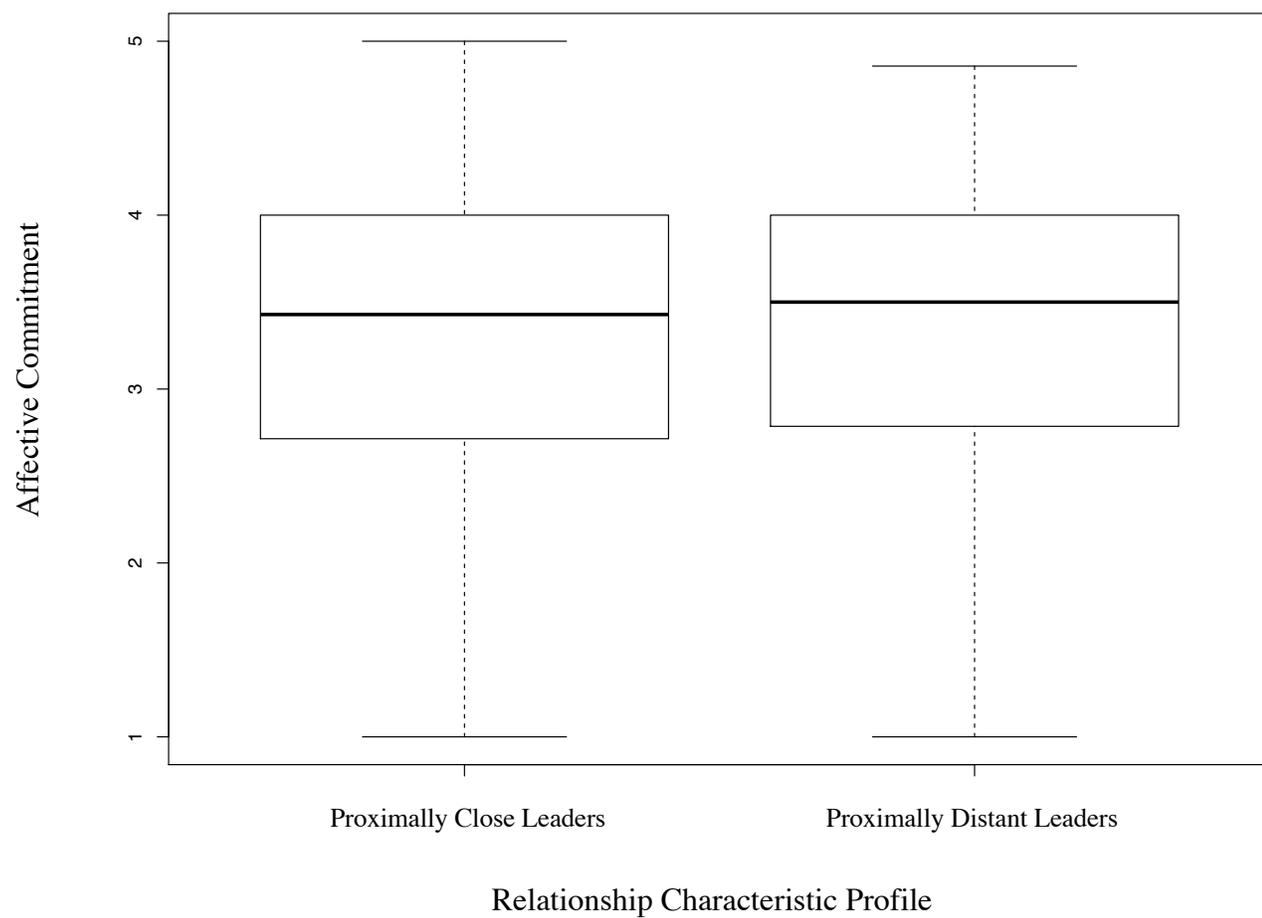


Figure 3. Boxplots of Affective Commitment by Relationship Characteristic Profile.

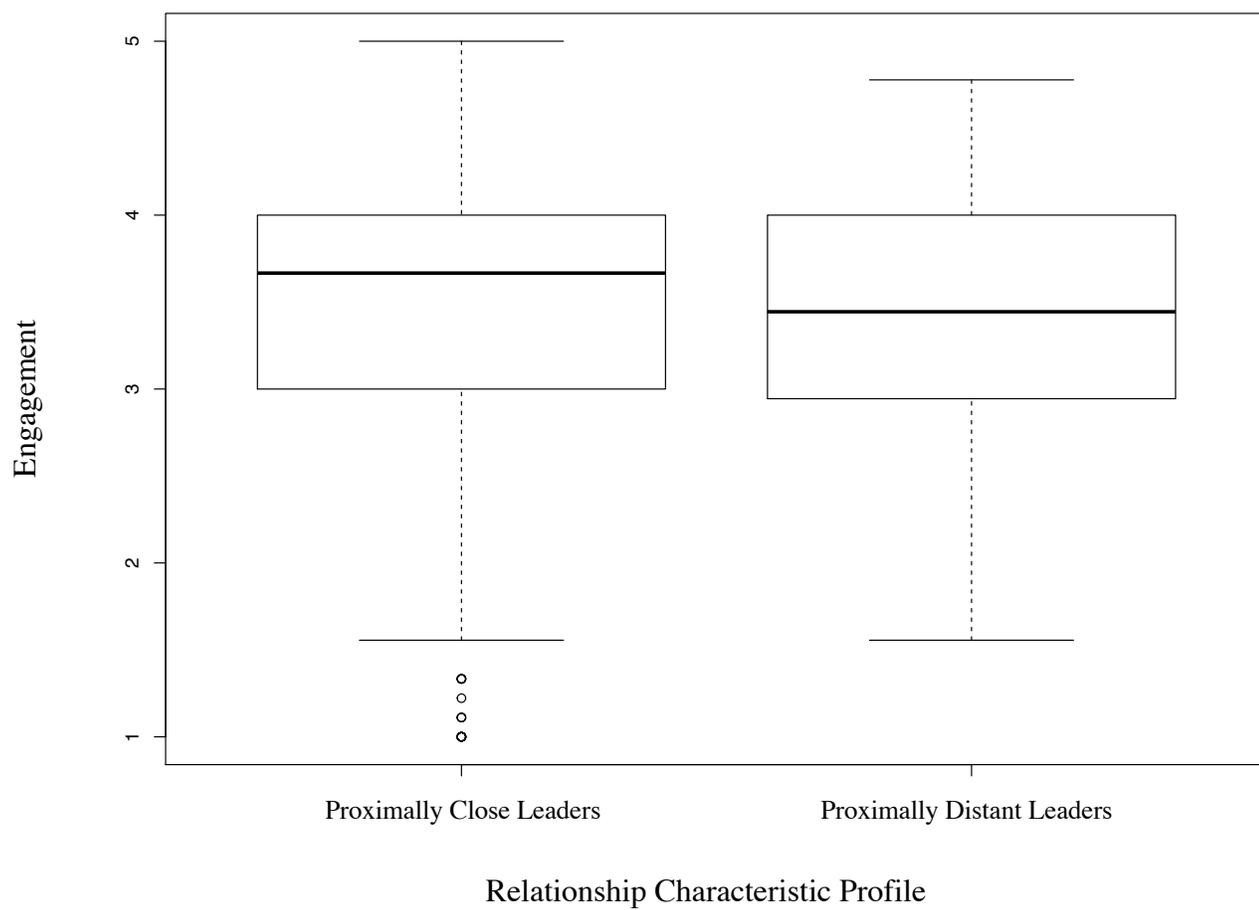


Figure 4. Boxplots of Engagement by Relationship Characteristic Profile.

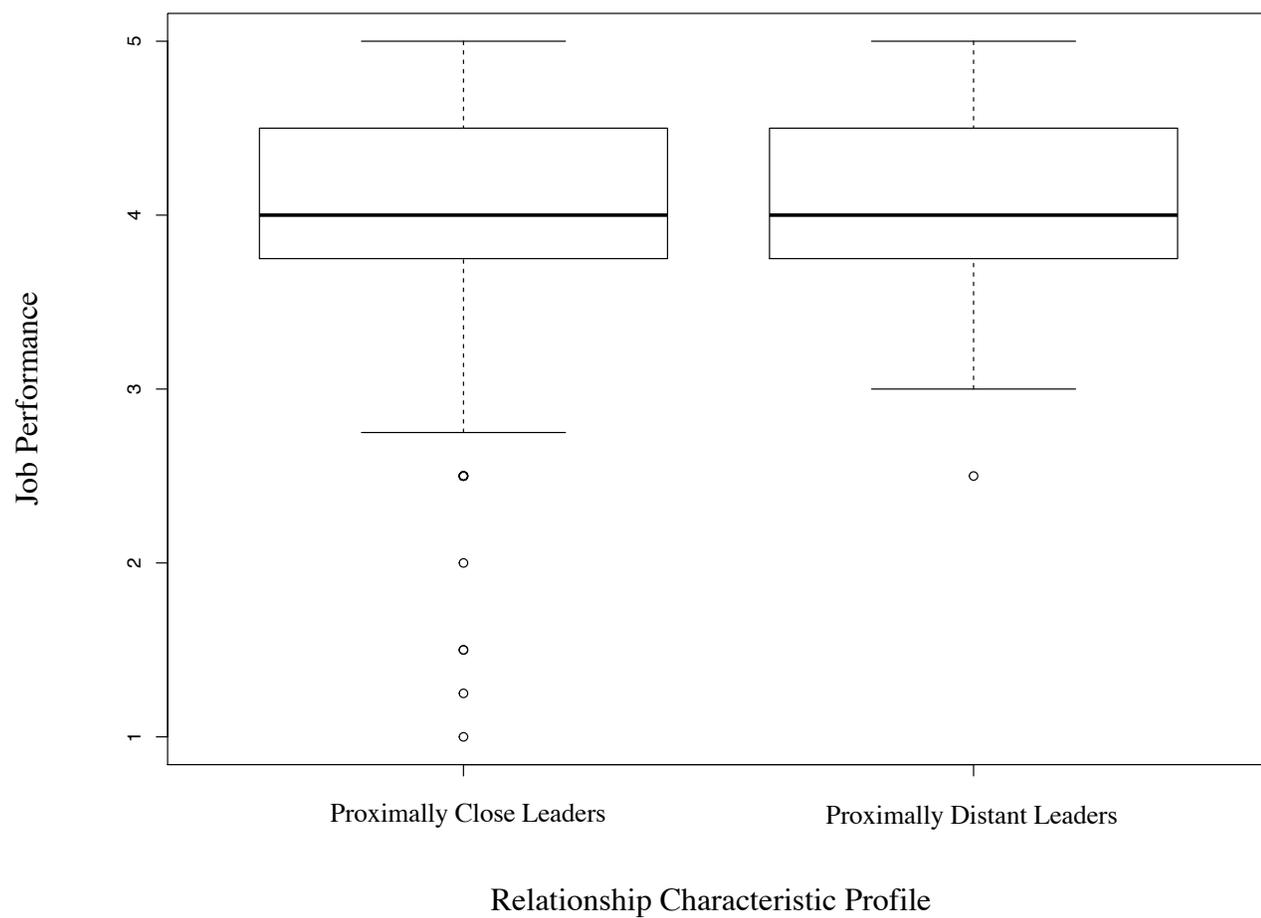


Figure 5. Boxplots of Job Performance by Relationship Characteristic Profile.

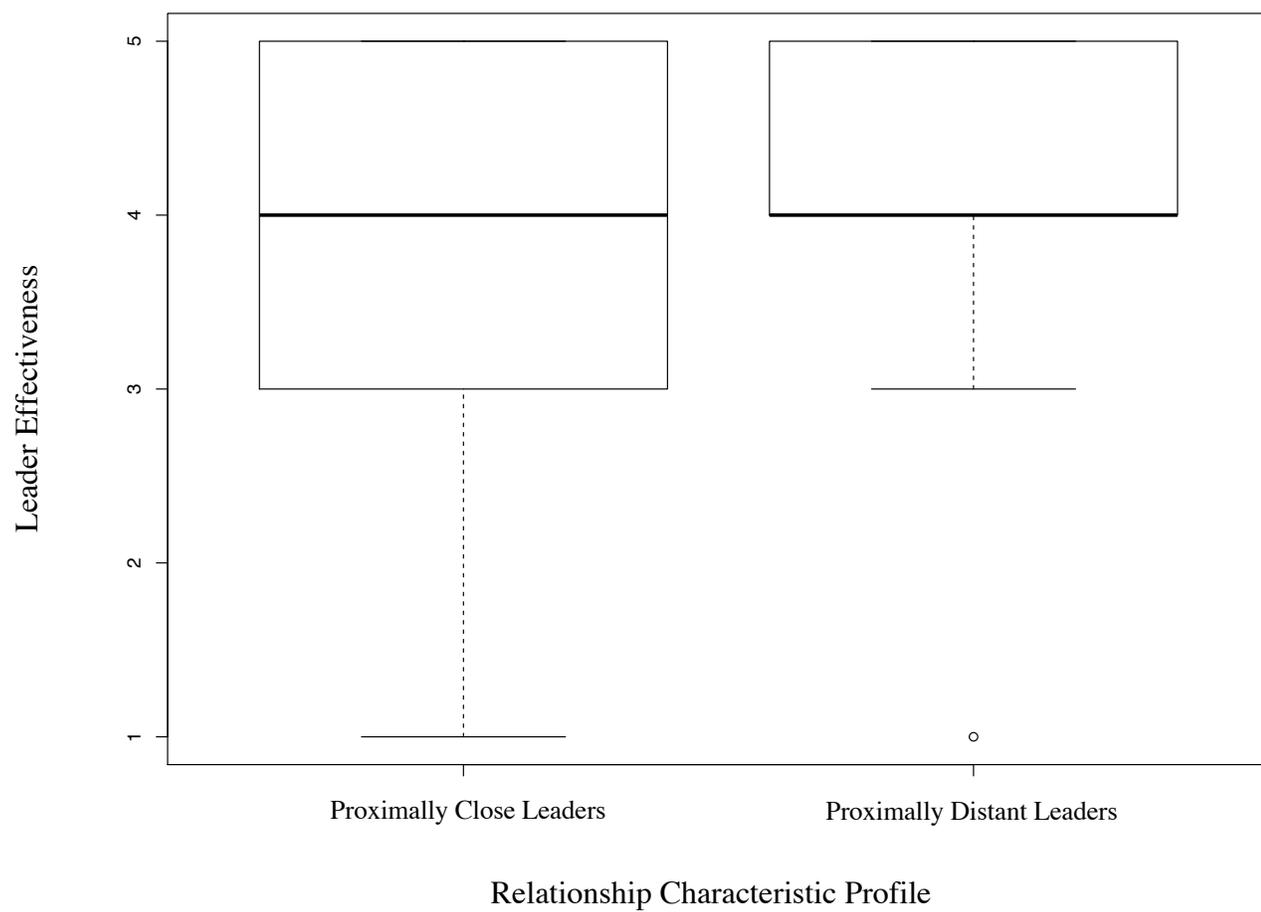
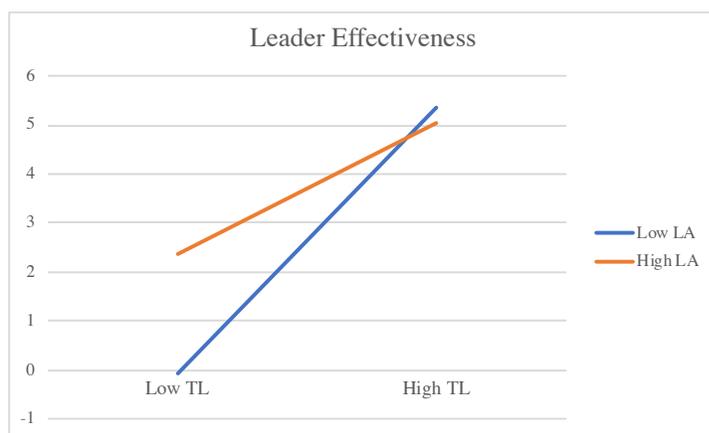
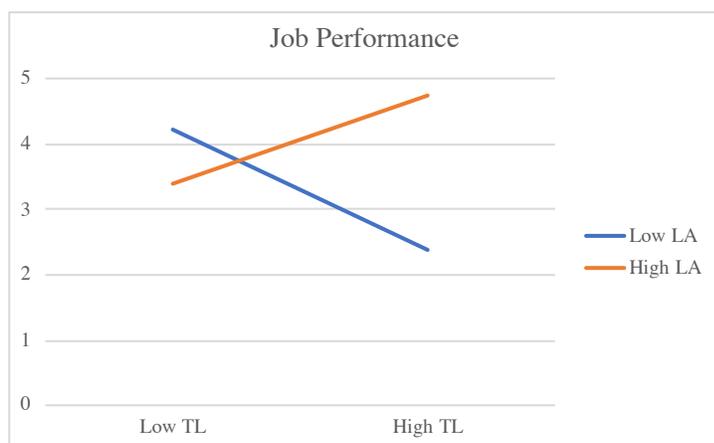
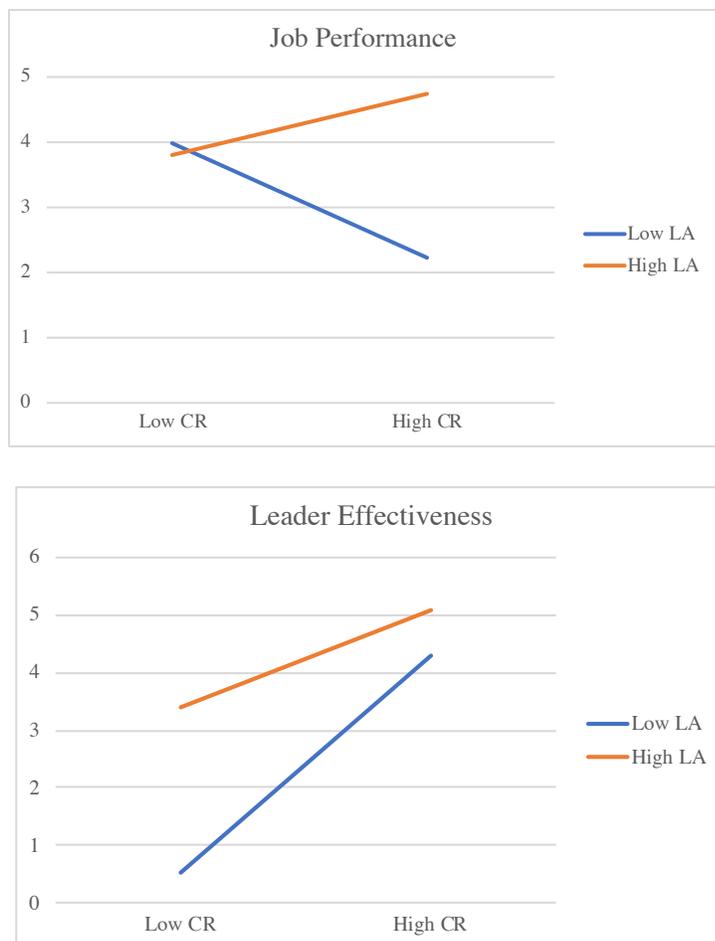


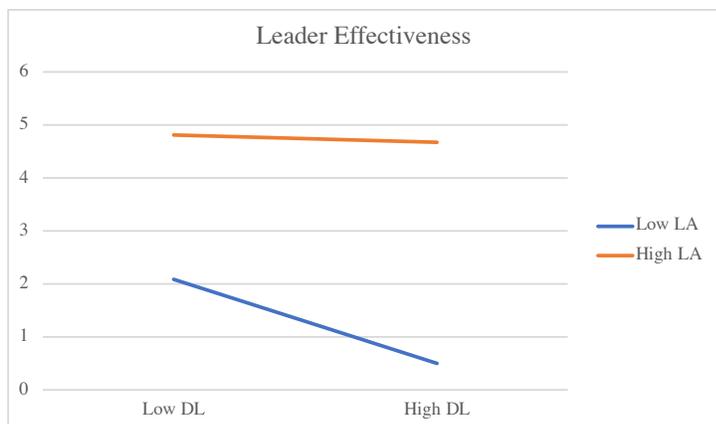
Figure 6. Boxplots of Leader Effectiveness by Relationship Characteristic Profile.



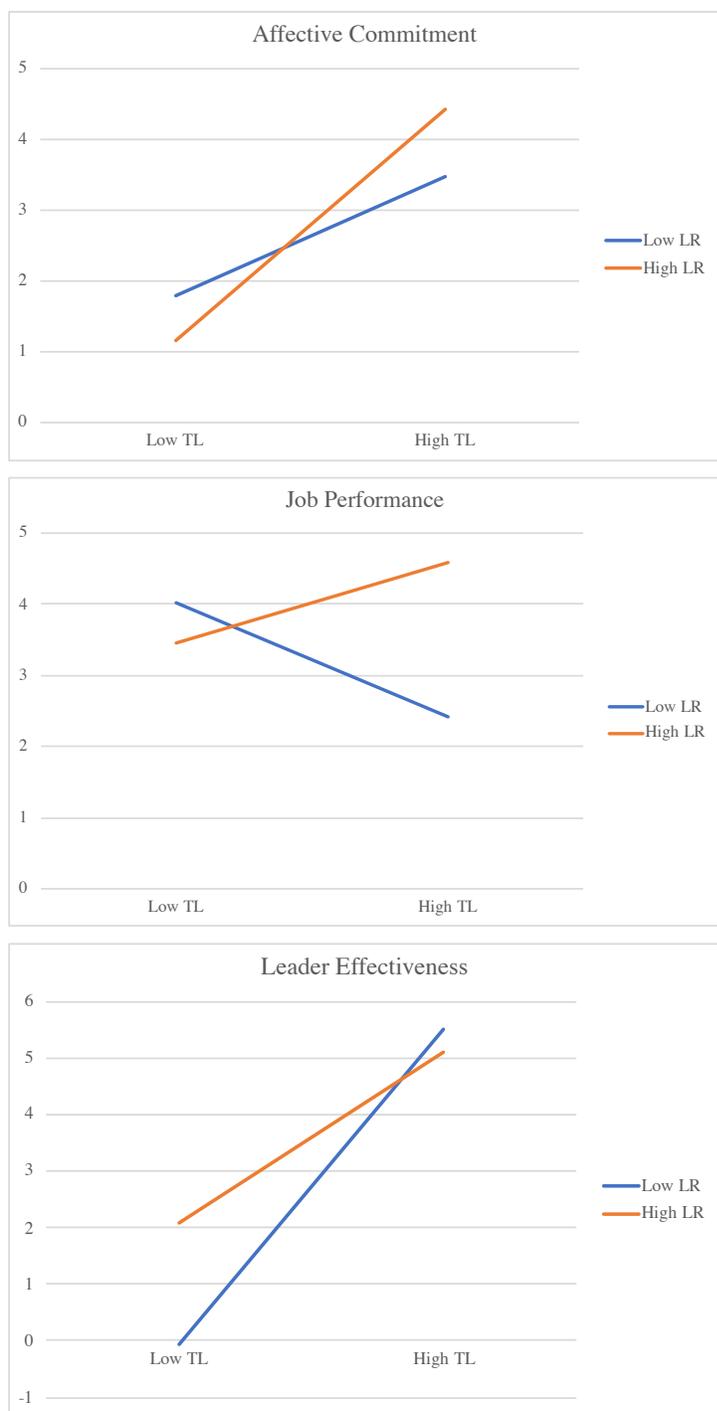
*Figure 7.* Interaction Graphs for Leader Availability as a Moderator to the Relationship between Transformational Leadership and Follower Outcomes. TL = Transformational leadership, LA = Leader availability.



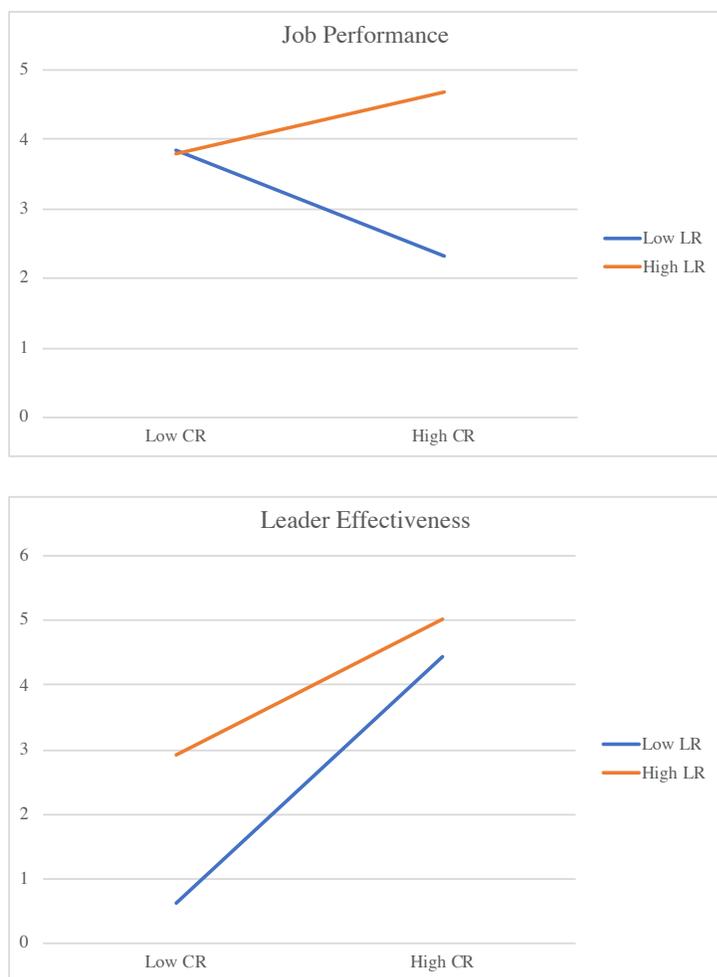
*Figure 8.* Interaction Graphs for Leader Availability as a Moderator to the Relationship between Contingent Reward Leadership and Follower Outcomes. CR = Contingent reward leadership, LA = Leader availability.



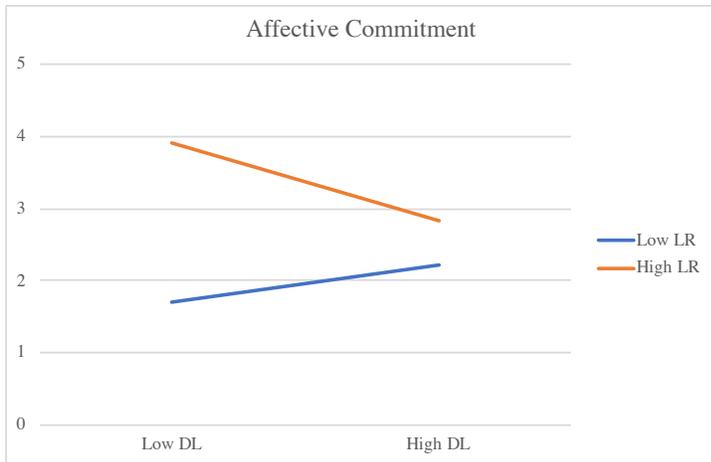
*Figure 9.* Interaction Graph for Leader Availability as a Moderator to the Relationship between Destructive Leadership and Leader Effectiveness. DL = Destructive leadership, LA = Leader availability.



*Figure 10.* Interaction Graphs for Leader Responsiveness as a Moderator to the Relationship between Transformational Leadership and Follower Outcomes. TL = Transformational leadership, LR = Leader responsiveness.

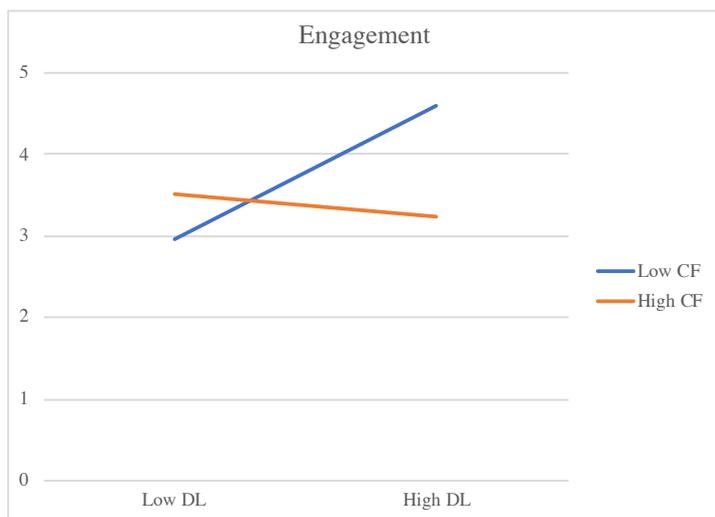
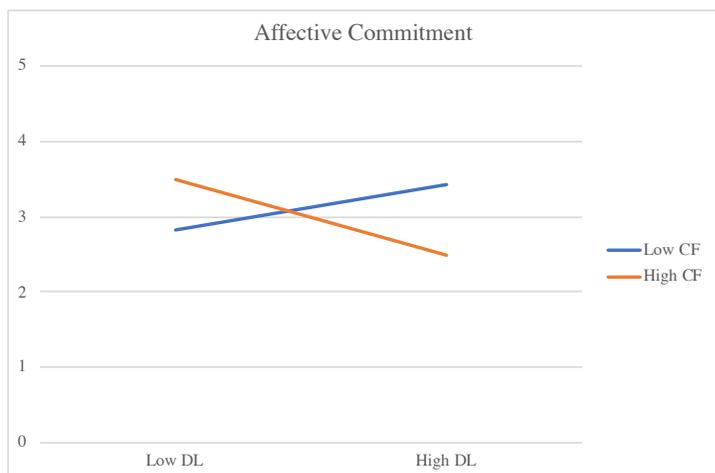
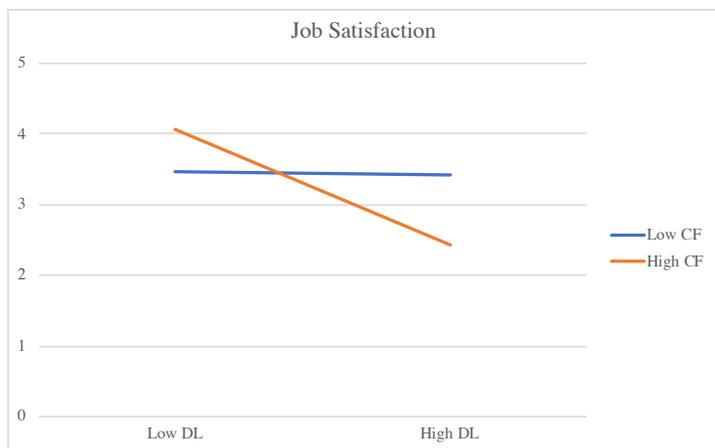


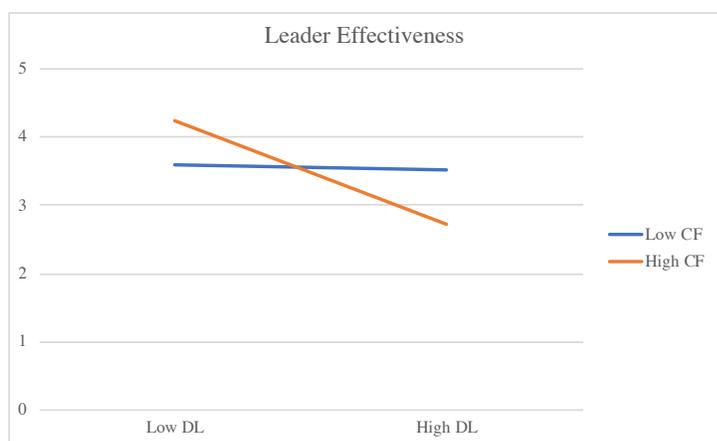
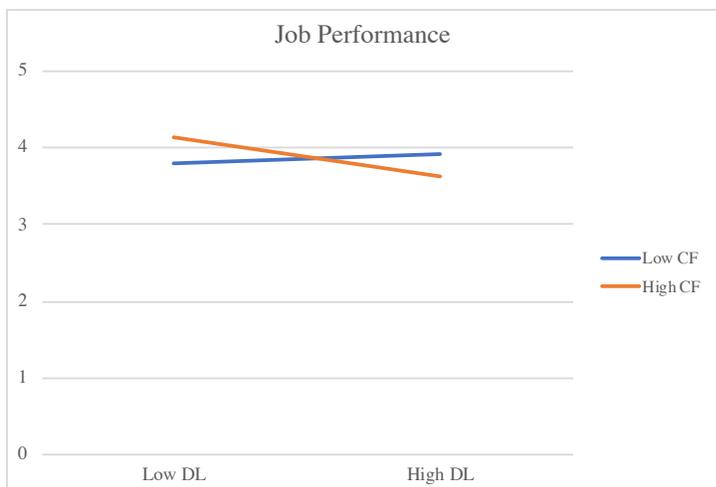
*Figure 11.* Interaction Graphs for Leader Responsiveness as a Moderator to the Relationship between Contingent Reward Leadership and Follower Outcomes. CR = Contingent reward leadership, LR = Leader responsiveness.



*Figure 12.* Interaction Graph for Leader Responsiveness as a Moderator to the Relationship between Destructive Leadership and Affective Commitment. DL = Destructive leadership, LR = Leader responsiveness.

*Figure 13.* Interaction Graphs for Communication Frequency as a Moderator to the Relationship between Destructive Leadership and Follower Outcomes. DL = Destructive leadership, CF = Communication frequency.





**APPENDICES**

## **Appendix A:**

### **Leader Availability and Leader Responsiveness Factor Analyses**

The following steps were taken to examine the factor structure of the leader availability and leader responsiveness scales. First, a CFA was conducted on the leader availability scale, which displayed poor fit for a 1-factor solution,  $\chi^2(14) = 483.47, p = .00, CFI = .80, TLI = .70, RMSEA = .23 [.22, .25], SRMSR = .11$ . Examination of the factor structure indicated that the reverse coded items loaded higher onto the single factor than the positively worded items. Next, an Exploratory Factor Analysis (EFA) was conducted on the leader responsiveness items, as they comprised a new scale developed for this study, with no existing empirical evidence for its factor structure. Examination of the scree plot and eigenvalues (4.84 as the first eigenvalue, .80 as the second) indicated that a 1-factor solution fit the data well. The 1-factor solution explained .54 variance and the factor loadings onto the single factor were greater than .40. A 2-factor solution also fit the data well, explaining .65 of the variance, split between .33 and .32 for each factor. The 2-factor solution resulted in the reverse-scored items loading onto a separate factor than the positively worded items. A 3-factor solution did not fit the data well, as adding a third factor only explained an additional .03 of the variance.

To examine whether the leader availability and leader responsiveness scales were distinct from one another and to further explore the factor structure of the positively and negatively worded items, I conducted a series of CFAs. First, I tested the following factor structures on all leader availability and leader responsiveness items: 1-factor solution, 2-factor solution with items loading on their respective scales, 3-factor solution with positively worded items loading on their respective scales and all negatively worded items loading on one factor, and a 4-factor solution with positively worded items on their respective scales and the negatively worded items loading

onto separate factors for their respective scales (see Table 1). The factor solutions that loaded negatively coded items onto separate factors fit the data better than the 1- and 2-factor solutions, with higher *CFI* and *TLI* values as well as lower RMSEA values. The 4-factor solution displayed slightly more favorable fit statistics than the 3-factor solution, supporting the distinction between leader availability and responsiveness. Based on these results, it seemed likely that the negatively worded items on both scales were affecting the factor structure. I conducted an additional set of CFAs with all negatively worded items dropped. With only the positively worded items for the leader availability and responsiveness scales, I first tested a 1-factor solution and 2-factor solution. The 2-factor solution displayed stronger fit statistics than the 1-factor solution (see Table 1). Finally, to test for the distinctness between leader availability and responsiveness, I examined a 2-factor solution with the covariance of the two factors constrained to 1. The free 2-factor solution fit statistics appeared favorable to those for the constrained 2-factor solution, and I conducted a chi-square difference test to confirm that the free model fit significantly better than the constrained model. The chi-square difference test indicated that the free 2-factor model fit better than the constrained model,  $\chi^2(1) = 130.41, p < .001$ . Based on these results, I concluded that leader availability and leader responsiveness were distinct from each other, and I removed the negatively worded items from both scales for all analyses.

Table 1

*Leader Availability and Leader Responsiveness Confirmatory Factor Analyses*

Solution	ML Min Test Stat	df	$p$ ( $\chi^2$ )	Baseline Min Test Stat	df	$p$	CFI	TLI	LL ( $H_0$ )	LL ( $H_1$ )	Free param	AIC	BIC	Adj. BIC	RM SE A	RMSEA CI	$p_{RMSEA}$ < .05	SRM SR
<i>All items included</i>																		
1-Factor	1864.24	104	.00	7130.81	120	.00	.75	.71	-11388.31	-10456.18	32	22840.61	22982.10	22880.51	.17	(.16, .17)	.00	.10
2-Factors	1719.23	103	.00	7130.81	120	.00	.77	.73	-11315.80	-10456.18	33	22697.60	22843.51	22738.74	.16	(.15, .17)	.00	.10
3-Factors	596.89	101	.00	7130.81	120	.00	.93	.92	-10754.63	-10456.18	35	21579.26	21734.02	21622.90	.09	(.08, .10)	.00	.05
4-Factors	383.10	98	.00	7130.81	120	.00	.96	.95	-10647.73	-10456.18	38	21371.47	21539.49	21418.85	.07	(.06, .08)	.00	.04
<i>Positive Items Only</i>																		
1-Factor	216.95	27	.00	3094.03	36	.00	.94	.92	-5871.51	-5763.03	18	117790.01	11858.60	11801.45	.11	(.09, .12)	.00	.04
2-Factors (F)	110.50	26	.00	3094.03	36	.00	.97	.96	-5818.28	-5763.03	19	11674.56	11758.57	11698.25	.07	(.06, .09)	.00	.03
2-Factors (C)	240.90	27	.00	3094.03	36	.00	.93	.91	-5883.48	-5763.03	18	11802.96	11882.55	11825.41	.11	(.10, .13)	.00	.52

*Note.* ML Min Test Stat = Maximum Likelihood Estimate, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, LL = Loglikelihood, AIC = Akaike's Information Criterion, BIC = Bayesian Information Criterion, RMSEA = Root Mean Square Error of Approximation, SRMSR = Standardized Root Mean Square Residual. For All Items Included, the 2-Factor solution loaded items onto their respective scales, 3-Factor solution loaded positively worded items onto their respective scales and all negatively worded items onto one separate factor, and the 4-factor solution loaded positively and negatively worded items onto separate factors for their respective scales. For Positive Items Only, 2-Factors (F) = Free model with items loaded onto their respective factors, 2-Factors (C) = Constrained model with the covariance of the 2 factors constrained to 1.

## **Appendix B:**

### **Dissertation Proposal**

Advanced communication technology enables individuals to complete work essentially anytime, anywhere, and with anyone around the world. As a result, virtual work, flexible work arrangements, or telecommuting (i.e., the ability to work away from a main company office for at least part of the workweek) has become increasingly prominent (Allen, Golden, & Shockley, 2015). While virtual work arrangements attract employees, increase diversity, and have the potential to positively impact organizational performance, they also can lead to communication challenges, ambiguity around work, and feelings of isolation (Bell, McAlpine, & Hill, in press). A virtual worker's leader can play an important role in determining the valence of the virtual work experience, and research shows that effective leadership in remote or distant settings can positively impact followers' trust, satisfaction, commitment, and performance (Bonet & Salvador, 2017; Golden & Veiga, 2008; Kelley & Kelloway, 2012; Timmerman & Scott, 2006). However, findings are mixed in terms of what makes virtual leadership effective, likely due to the numerous operationalizations of the "virtual context" variable. Researchers operationalize virtuality in several ways, including leader-follower physical distance, proportion of followers' time spent in a main office, dependence on technology, and media choice (Bell et al., in press), making it difficult to compare results across studies and draw conclusions about effective leadership behaviors in remote settings. In order to better understand the contingencies on which virtual leadership can benefit remote workers, the first purpose of this study is to holistically examine the virtual work experience by looking at several leader-follower relationship context variables, including geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader availability, and leader responsiveness. I

will investigate the types of leader-follower working relationships that tend to exist in the workplace today by examining how the set of relationship characteristic variables define latent profiles of follower work experiences. I will also examine the relationships among these variables with follower outcomes including job satisfaction, commitment, engagement, performance, and perceived leader effectiveness in order to determine which aspects of the virtual leader-follower relationship are most important for particular outcomes. Finally, I will examine the ways in which transformational, transactional, and destructive leadership behaviors interact with aspects of the virtual relationship context to influence follower outcomes. Ultimately, I will attempt to expand knowledge on the aspects of the virtual leader-follower relationship that augment and negate leadership's influence on follower outcomes.

In the following sections, I discuss the prominence of virtual work and the challenges faced by virtual workers. Then, I define virtual leadership and review relevant research. Then, I outline research gaps in the virtual leadership literature and present the proposed study. Finally, I outline the study variables and present my research questions.

### **Virtual Work**

Virtual workers are individuals who rely on electronic tools to communicate and who are distributed geographically from their leader and/or coworkers (Bell & Kozlowski, 2002). Researchers tend to view work "virtuality" on a continuum rather than dichotomizing work as virtual or not, and have operationalized this continuum as a composite of various dimensions such as media richness, synchronicity of communication, and the degree to which workers rely on technology to interact (Al-Ani, Horspool, & Bligh, 2011; O'Leary & Cummings, 2007; Zigers, 2003). Most workers tend to lie somewhere in the middle of the continuum between two extremes, one characterized by face-to-face or collocated workers who communicate

synchronously, and the other characterized by geographically distributed workers who communicate asynchronously via electronic tools (Al-Ani et al., 2011).

**Prominence of virtual work.** The Society of Human Resource Management reported in 2016 that the prominence of telecommuting had tripled over the previous twenty years, and approximately half of all companies utilize virtual work teams today (Bell et al., in press; SHRM, 2016). Additionally, 85% of workers in a sample drawn from 80 countries indicated they worked on a virtual team in 2016 (RW<sup>3</sup> CultureWizard, 2016).

The number of global virtual workers has grown for several reasons, including globalization, increased use of outsourcing, and continuous technological advancements (Bell et al., in press). Organizations have increasingly affordable access to ample options for advanced communication technology (e.g., chat-based messaging, video conferencing) which enable synchronous, rich communication and seamless information sharing (Bell et al., in press). Virtual work also appeals to organizations because the removal of geographic constraints on potential job candidates enables recruitment of an optimally skilled and culturally diverse workforce (Bell et al., in press; Shuffler, Kramer, & Burke, 2016; Zaccaro & Bader, 2003). Geographic dispersion combined with enriched information sharing capability also enables a 24-hour workday, enhancing organizations' productivity and efficiency (Dulebohn & Hoch, 2017). Additionally, virtual work opportunities can attract and retain employees (Martins, Gilson, & Maynard, 2004), increase morale, and reduce absenteeism (Solomon, 2000). Working from home allows employees more control over work-life balance, and some research shows that remote workers are less stressed, experience fewer distractions, and have increased quality of family life (Bell et al., in press; Carter, Seely, Dagosta, DeChurch, & Zaccaro, 2015; Solomon, 2000).

**Virtual work challenges.** Although there are many benefits to virtual work, these arrangements also present several challenges to organizations and their workers, and some researchers (e.g., Avolio & Kahai, 2003; Dahlstrom, 2013; Kelley & Kelloway, 2012; Liao, 2017) argue that remote work is more complex than collocated work. One reason for the complexity of virtual work is that reliance on electronic tools poses communication challenges. Misinterpretation of messaging and inaccurate perceptions of others are likely to result from computer-mediated communication because participants lack nonverbal cues and rich social information (Kelley & Kelloway, 2012). Remote workers also have fewer opportunities to engage in spontaneous communication and to develop interpersonal relationships compared to collocated workers (Al-Ani et al., 2011; Kiesler & Cummings, 2002). These communication challenges can contribute to accelerated conflict and mistrust (Avolio & Kahai, 2003). Additionally, geographic dispersion means that individuals work in different time zones, come from various cultural backgrounds, speak different primary languages, and have different social norms (Bell & Kozlowski, 2002; Carter et al., 2015), which can potentially result in communication issues and reduced trust (Stahl, Makela, Zander, & Maznevski 2010). Virtual workers also often feel isolated (Crandall & Gao, 2005; Dahlstrom, 2013; Kelley & Kelloway, 2012), or “out of sight, out of mind” to others in the company (Crandall & Gao, 2005; Gibson, Blackwell, Dominicis, & Demerath, 2002). They can be particularly sensitive to justice perceptions, especially regarding the fairness of information sharing and promotion opportunities for remote workers compared to onsite workers (Crandall & Gao, 2005). Virtual workers also face the challenge of adapting to their organization’s technology, and difficulty sharing information amongst team members can impair the coordination of remote work, ultimately impacting productivity (Al-Ani et al., 2011; Carter et al., 2015). Finally, because virtual workers

are available via many forms of media, they can face work-life balance issues due to continuous interruptions and the ability to receive messages after working hours. The burden of constant availability has been linked to decreased performance and increased stress (Stokols, Shalini, Runnerstrom, & Hipp, 2009), which can lead to burnout (Avolio, Sosik, Kahai, & Baker, 2014). Galustian (2014) interviewed virtual workers and found that they had a heightened need for interpersonal and contextual variables such as trust, relationship building, empowerment, and visibility compared to collocated workers. Effective leadership has been suggested as one way in which organizations can address the challenges faced by virtual workers.

### **Leadership**

Decades of research show that leadership behavior predicts follower performance, job satisfaction, and several other follower outcomes including job attitudes and retention (Lord, Day, Zaccaro, Avolio, & Eagly, 2017). Leadership can be defined as the process of exerting intentional influence over others to guide, structure, and facilitate activities and relationships (Yukl, 2006). It has also been defined as an influencing process that results from follower perceptions of leader behavior and attributions of the leaders' dispositional characteristics (Antonakis & Atwater, 2002). Leadership behaviors typically manifest in two broad categories: initiating structure and consideration (Judge, Piccolo, & Ilies, 2004). Initiating structure refers to the monitoring, managing, and directing of task-related follower behavior, while consideration refers to relational behaviors that cater to the needs, values, and emotions of followers. Building upon research on initiating structure and consideration, Avolio and Bass (1991) presented Full Range Leadership Theory, which they argue encompasses all types of behaviors in which a leader might engage, broken down into the dimensions of laissez-faire, transformational, and transactional leadership. Laissez-faire leadership, or nonleadership, is characterized by a leader

not engaging in directive or relational leadership behaviors with followers. Transformational leadership is the process of influencing followers to transform their attitudes in a way that produces higher performance (Bass, 1985). By appealing to followers' trust, admiration, and respect, transformational leaders motivate their followers to do more than they expected and to sacrifice for the group. Transformational leaders make emotional appeals to followers via four types of behavior: individualized consideration (differential personal treatment), inspirational motivation (painting a picture of the future), intellectual stimulation (challenging followers to grow), and idealized influence (charisma). Transactional leadership can be defined as the influence process by which a leader exchanges rewards for followers' effort (Burns, 1978). There are three dimensions of transactional leadership: contingent reward (leader provides adequate rewards for adequate performance), active management by exception (leader actively steps in when follower does wrong), and passive management by exception (leader steps in after follower does wrong).

Working at a distance from one's followers and/or communicating via technology can impair leaders' ability to engage in and convey both transformational and transactional leadership behavior (Bell et al., in press). For instance, distance can make it challenging to set goals and direction for a team, and to monitor followers' progress toward goal accomplishment (Shuffler et al., 2016). Additionally, the lack of informal face-to-face interaction can make it difficult to understand followers' interpersonal needs. Email and chat-based communication tends to involve more task-related topics (rather than non-work or social topics) than face-to-face interaction (Al-Ani et al., 2011), making it difficult for leaders at a distance to build interpersonal relationships and trust with their followers. Therefore, relationship building, motivational

behavior, and the management of work dynamics are arguably more challenging from a distance (Hoch & Kozlowski, 2014).

**Virtual leadership.** Leadership research tends to assume that leaders interact with followers via close, personalized contact (Joshi, Lazarova, & Liao, 2009). Bligh and Riggio (2012) argue that existing leadership theories imply that communication frequency, distance, and the media utilized do not matter in terms of how leaders influence followers. Al-Ani and colleagues (2011) question whether traditional leadership constructs are transferable to virtual leader-follower environments, and Liao (2017) argues that the benefits of virtual work assume the presence of effective leadership. In sum, traditional leadership theories may not necessarily apply to virtual leadership because it occurs in a different context. Avolio and Kahai (2003) argue that the differences in the leader-follower relationship in virtual work versus traditional work warrant a focus on “e-leadership” as a distinct construct to understand the dynamics of virtual leader-follower dyads.

**Virtual leadership definition.** Virtual leadership has been referred to as e-leadership (Avolio, Kahai, & Dodge, 2000), remote leadership (Kelley & Kelloway, 2012), and distance leadership (Antonakis & Atwater, 2002) in the literature. One complexity in defining the virtual leadership construct is that it is highly intertwined with the context variable of virtuality (Bell et al., in press). Avolio et al. (2014) argue that the context is part of the virtual leadership construct, while Shamir (2013) argues that virtuality is a characteristic of the context of the leader-follower relationship, but not a characteristic of the leader him/herself. Zaccaro and Bader (2003) define an e-leader as a leader who conducts many processes via electronic channels. Avolio et al.’s (2000) definition focuses on the reciprocal relationship between leadership and technology (i.e., how technology has influenced leadership and how technology has transformed to facilitate

leadership). Their latest definition was presented in 2014, which defines e-leadership as a “social influence process embedded in both proximal and distal contexts mediated by AIT [Advanced Information Technology] that can produce a change in attitudes, feelings, thinking, behavior, and performance” (pp. 617).

Several frameworks for virtual or distance leadership have been presented in the literature. Bogardus (1927) was the first to reference leadership distance, and Rummel (1976) referenced four categories of distance including material, psychological, social, and cultural distance. Napier and Ferris (1993) defined dyadic leader-follower distance on three dimensions: psychological, structural, and functional, and conceptualized physical distance in terms of these three aspects of the relationship. Antonakis and Atwater (2002) present the most commonly cited distance typology which defines leader-follower distance on a matrix with three dimensions: social distance, physical distance, and perceived interaction frequency. The authors equate social distance to psychological distance, and define it as “perceived differences in status, rank, authority, social standing, and power” between a leader and follower (pp. 682). Physical distance refers to how closely a leader and follower are located, and perceived interaction frequency refers to the follower’s perception of the frequency with which the leader-follower dyad communicates. Antonakis and Atwater argue that frequency of communication directly impacts how close followers perceive their leader. While these frameworks present a conceptual grounding for virtual leadership, they do not provide enough detail on the idiosyncrasies of each virtual worker’s experience with his/her leader. Rather than examining virtual leadership based on followers’ general perceptions about their leaders’ distance, this study will examine specific aspects of the working relationship to more tangibly measure leadership distance.

***Virtual leadership challenges.*** In Bell and Kozlowski's (2002) discussion of leading virtual teams, they distinguish amongst challenges associated with different dimensions of the virtual working relationship. The first dimension, temporal distribution (i.e., dispersion in different time zones), makes it challenging for leaders to monitor and manage follower performance because leaders cannot always physically observe the work. Another dimension, boundary spanning (i.e., the extent to which followers span different geographic regions and cultures), means leaders need to adapt to different follower needs. Virtual leaders have followers across cultures in which norms vary in terms of power distance, uncertainty avoidance, and preferences for work-relevant behaviors like receiving feedback (Erez, 2011). Virtual leaders also typically vary in the degree to which they work collocated and at a distance from their set of followers, adding to the complexity of their role, and making it difficult to engage in one set of effective behavior across all followers and situations.

Due to the ambiguity in virtual work settings and challenges faced by virtual workers, many researchers argue that virtual leadership behavior has more severe implications for follower outcomes than leadership behavior in traditional collocated settings (Bell & Kozlowski, 2002; Hill & Bartol, 2016; Hoch & Kozlowski, 2014; Joshi et al., 2009; Liao, 2017). Gibbs, Sivunen, and Boyraz (2017) refer to this concept as the "strong" leadership approach, which argues that virtual work requires stronger or *more* leadership behaviors (e.g., setting structural boundaries, coordinating team members, establishing a shared direction) than collocated work to produce positive outcomes. Golden and Veiga's (2008) findings demonstrate the strong leadership effect. They found an interaction between leader-follower distance and leader-member exchange (LMX) behaviors, such that leader-follower dyads with a high LMX relationship had higher commitment when they were virtual compared to collocated, and that

dyads with low LMX relationships had lower commitment in virtual compared to collocated dyads. Hoch and Kozlowski (2014) argue that strong leadership is a key mechanism through which organizations can mitigate the threats to motivation loss, coordination issues, and performance deficits that can potentially occur in virtual work settings. Gibson et al. (2002) suggest situational leadership theory, which states that one leadership style does not fit all workers nor all contexts (Hersey & Blanchard, 1982), as a framework for effective virtual leadership, arguing that virtual leaders must adapt their behaviors to demands of various leader-follower dyads, and in more complex ways than collocated leaders.

Not all researchers have agreed on the relevance of leadership to virtual work (Al-Ani et al., 2011). Kerr and Jermier (1978) argue that working in a virtual context makes it impossible for leader behaviors to influence follower outcomes. They claim that distance makes leader behaviors irrelevant and neutralizes their effect on follower outcomes. Their perspective stems from their Substitutes for Leadership theory, which states that in certain situations, contextual variables can replace, or substitute, for leader behavior's role in influencing follower outcomes. For example, contextual variables such as formal guidelines and team member support can substitute for leader behavior's influence on follower performance. Notably, Kerr and Jermier's claims were made in 1978, well before advancements in technology, and phone calls were likely the extent to which leaders and followers could communicate virtually. Their ideas do not necessarily apply to the typical virtual work context today. However, in line with the idea that virtuality negates leader behavior's influence on follower outcomes, technology can potentially operate as a leadership substitute, and could negate the importance of leader behaviors because electronic tools allow for seamless work coordination, progress monitoring, and other typical leader behaviors. In contrast, other researchers (e.g., Antonakis & Atwater, 2002; Avolio &

Kahai, 2003) have argued that technology can potentially render virtual leaders even more influential by allowing them to monitor work closely and interact with followers using even richer media than they can face-to-face.

Some researchers argue that virtual leadership requires an additional skill set on top of the requirements of traditional face-to-face leaders (Bell et al., in press; Hoch & Kozlowski, 2014). One study found that 87% of leaders agreed that virtual leadership required more from them than collocated leadership, and 92% of senior executives agreed that virtual leadership required different skills than face-to-face leadership (Center for Creative Leadership, 2007; Bell et al., in press). Another survey found that 80% of leader respondents reported that leading remotely affected their ability to perform initiating structure behaviors (Institute of Leadership and Management, 2015). In general, the additional skills needed by virtual leaders pertain to overcoming the barriers of influencing and building relationships when not collocated with followers (Dulebohn & Hoch, 2017). The challenges faced by virtual leaders are outlined below.

First, distance can make it difficult for leaders to establish an authoritative presence or communicate their hierarchical standing (Ocker, Huang, Benbunan-Fich, & Hiltz, 2011; Zigurs, 2003). Virtual leaders must establish a leadership presence without the physical cues that collocated leaders can utilize in traditional office settings, such as having a corner office or sitting at the head of the table in a meeting. Virtual leaders also face the difficult task of monitoring follower progress toward goals and general team processes without sight into day-to-day work tasks (Dulebohn & Hoch, 2017). The inability to synchronously manage followers' work presents challenges around detecting poor performance, mistakes, teamwork issues, and the need for additional resources (Bonet & Salvador, 2017; Carter et al., 2015). Unlike collocated leaders who can easily observe performance fluctuation or tension amongst team members,

virtual leaders must come up with ways to regularly gather this information in a reliable way (Avolio et al., 2014). Another challenge faced by virtual leaders surrounds communication with their followers. Use of technology can hinder leaders' ability to convey and interpret emotions, which can impede both relationship-building and motivational behaviors (Avolio et al., 2014). For example, difficulty expressing positivity or excitement via technology can hinder leaders' ability to align team members to a common goal. For these reasons, some researchers argue that virtual leaders have less influence over their followers compared to collocated leaders (Dulebohn & Hoch, 2017). Additionally, communication issues pose challenges for knowledge and information sharing between leaders and followers (Zander, Zettinig, & Makela, 2013). Difficulty sharing information can lead to performance issues as well as justice perception issues among team members around timing of information dispersion and the extent of consistency across team members. Relatedly, virtual team leaders tend to work at varying distances from their followers (i.e., some followers may work in the same time zone as the leader while others may live in a different country, meaning that the leader may spend inconsistent amounts of time collocated with his/her set of followers). Differential treatment and attention to followers has implications for their fairness perceptions. Additionally, Avolio and Kahai (2003) point out that equal time across followers may not be desirable or beneficial (e.g., some followers may prefer more autonomy than others). Another challenge for virtual leaders surrounds work-life balance. When leading a team located around the globe, leaders may feel pressure to make themselves available 24/7, especially with access to email and chat on devices at home. Leaders need to set boundaries as to whether they will respond to followers outside work hours, and they face risks for stress, burnout, and work-life balance issues (Avolio et al., 2014). Virtual leaders also face the challenge of keeping up with evolving technology. Additionally, Avolio et al. (2014) argue that

as technology advances, certain leader behaviors may become even more important. Media rich platforms such as video conferencing systems make it easier to express emotions and have interactions like those face-to-face, which puts pressure on leaders to convey authenticity when communicating via technology.

***Effective virtual leadership.*** Research has focused on practices to mitigate or overcome the challenges of virtual work. Armstrong and Cole (2002) found that leaders who provided coaching, modeled norms, initiated discussion with their team, set concrete goals, and acknowledged the difficulties of working virtually tended to have more successful virtual teams than leaders who engaged in less of these behaviors. Several qualitative studies have investigated effective virtual leadership behavior via interview data, with the following findings. Fisher (2014) found that leaders who set clear goals, emphasized the pros of dispersed teamwork, and created a sense of community tended to have highly engaged teams. Kayworth and Leidner (2001) found that effective virtual team leaders mentored their followers, delegated, frequently communicated with followers, and displayed empathy. Weisband (2002) found that successful virtual leaders applied pressure to complete task demands and also demonstrated consideration for team members. Malhotra, Majchrzak, and Rosen (2007) utilized interview and survey data to identify six effective practices of virtual leaders: establishing trust via technology, encouraging appreciation and understanding of diversity, managing meetings, monitoring follower performance via technology, providing followers visibility beyond the team, and encouraging team members to work together. Desper (2014) looked specifically at leader behaviors that mitigated negative outcomes (i.e., project failures) and found that empathy, understanding, and respect for diversity of cultural norms were important. They also found that effective virtual leaders engaged in frequent communication, established group rapport, and held regular

meetings for progress updates with direct reports. Finally, Dixon (2013) found that virtual team leaders had to hold team members accountable and ensure their followers had equal access to information more than leaders of collocated teams.

Research on the ways in which leadership behaviors interact with aspects of the virtual environment to influence followers has produced mixed findings. Hoch and Kozlowski (2014) found that team virtuality (i.e., the extent to which teams were geographically dispersed, relied on technology to communicate, and were culturally diverse) weakened the relationship between hierarchical leader behavior (i.e., transformational, leader-member exchange, and mentoring leader behaviors) and team performance. In contrast, Hill and Bartol (2016) found that the effect of empowering leader behavior (i.e., when leaders share power with followers to facilitate a supportive environment) on team collaboration was stronger on more dispersed teams (Arnold, Arad, Rhoades, & Drasgow, 2000). Similarly, Joshi et al. (2009) found that the relationship between inspirational leadership behaviors and team member commitment was stronger on dispersed teams. Notably, Hoch and Kozlowski operationalized virtual leadership as a composite of physical dispersion, technology use, and cultural differences, while both Hill and Bartol and Joshi et al. operationalized virtuality based on physical distance alone. Additionally, these studies looked at various leader behavior and follower outcome variables, making it difficult to draw one conclusion regarding whether virtual leadership strengthens or weakens leadership's influence on followers.

### **Research Gaps**

Research on virtual leadership continues to grow, but there are many mixed findings and remaining knowledge gaps. The necessity for more research in this area has been expressed by several researchers (e.g., Al-Ani et al., 2011; Avolio et al., 2014; Bell et al., in press; Bonet &

Salvador, 2017; Gilson, Maynard, Young, Vartiainen, & Hakonen, 2015; Golden & Veiga, 2008; Hoch & Kozlowski, 2014; Kelley & Kelloway, 2012; Liao, 2017; Schmidt, 2014) for many reasons. First, leadership research has generally lagged behind technological advancement, and the evolution of the technology used in the workplace has far outpaced the science of understanding its effects (Avolio et al., 2014). For example, very few virtual leadership studies examine the use of video conferencing systems or advanced chat-based messaging tools with most studies focusing on traditional electronic tools such as email (Gilson et al., 2015).

Another issue with current virtual leadership research is that many studies tend to simplify the virtual work construct. One way in which researchers simplify virtuality is by dichotomizing work as collocated or not. Categorizing workers as either remote or collocated overlooks the idiosyncrasies amongst work situations (Avolio et al., 2014). For example, two remote workers may spend varying degrees of time on site in an office, and they also might have extensive variability in how and where they conduct virtual work (e.g., from a coffee shop versus from a home office). As stated by Hoch and Kozlowski (2014), “virtuality has many nuances.” Another way in which researchers have simplified virtuality is by looking at only one dimension of the construct at a time. Researchers tend to only examine physical distance or technology dependence as an operationalization of the “degree of virtual work” in a given study (Bell et al., in press). Measuring only one aspect of the context does not allow for examining any nuance or interactions among different dimensions of virtual work. For example, operationalizing virtual work via physical distance does not allow for consideration of two workers who may use technology in different ways (e.g., one spends a large portion of the day on video conference with his/her leader, while one interacts infrequently with his/her leader via email). This composite approach to defining virtuality hinders researchers’ ability to make conclusions about

virtual work's influence on leader-follower dynamics, and the different operationalizations have resulted in mixed findings in the literature. Gilson et al. (2015) call for a unified operationalization of virtuality so that conclusions can be drawn across studies. Additionally, Gibson and Gibbs (2006) looked at four dimensions of virtuality (geographic dispersion, electronic dependence, structural dynamism, and national diversity) in aerospace teams and found that the four dimensions were not highly intercorrelated and also had differential relationships with team outcome variables. These findings highlight the importance of examining multiple aspects of the virtual work environment rather than drawing general conclusions about it based on one dimension. One other way in which researchers simplify virtuality is by only examining virtual work without comparing it to face-to-face work, making it difficult to determine whether any observed effects are unique to the virtual setting or generalize to all workers (Connaughton & Daly, 2004).

Even studies that examine multiple dimensions of virtual work (e.g., measure both physical distance and technology use) still tend to simplify the construct, and Bell et al. (in press) argue that more research is needed on the interaction of physical distance with other virtual work variables. Avolio et al. (2014) also call for more research on the interaction of social and physical leader-follower distance, which likely both play a role in virtual dyad dynamics. Additionally, few studies examine how leadership behavior interacts with the use of technology to communicate (Avolio et al., 2014; Hambley, O'Neill, & Klein, 2007), and others call for more research examining the aspects of virtuality that moderate the relationship between leader behavior and follower outcomes (Bell et al., in press).

There are several mixed findings on the effects of virtual leadership on follower outcomes. Early research assumed that virtuality or distance was generally harmful (i.e.,

weakened relationships, had negative effects, or created challenges for the leader-follower relationship). In support of these assumptions, some studies have found negative effects of virtuality on followers' trust in their leader (e.g., Merriman, Schmidt, & Dunlap-Hinkler, 2007), as well as negative effects of leader distance on follower performance (e.g., Podsakoff, MacKenzie, & Bommer, 1996). However, other studies have found that physical distance can augment the relationship between leader behaviors and follower performance (e.g., Orvis, 2004), and that remote leader-follower relationships can strengthen emotional bonding (Avolio et al., 2014; Jiang et al., 2013). More research is needed to parse out what makes virtual leadership beneficial or detrimental.

Another area warranting more research is on destructive leadership and virtuality. Most studies on leadership and virtual work examine transformational, transactional, or LMX behaviors. To the author's knowledge, no studies exist examining the role of destructive leadership in virtual contexts. Destructive leadership can be defined as repetitive or systematic leader behaviors that harm, or risk harm to, the organization and/or its members (Craig & Kaiser, 2012). Such behaviors can negatively affect follower performance, well-being, and satisfaction. Destructive leadership could potentially have an amplified effect in virtual contexts due to challenges forming interpersonal relationships. However, technology could also dampen the effect of destructive leadership on follower outcomes if, for example, experiencing destructive leadership behaviors via chat causes less harm to followers than experiencing it in person. More research is needed on how virtuality and destructive leadership interact to influence followers.

Other limitations in the virtual leadership literature surround study methodology. First, many studies have been conducted in a lab with undergraduate participants, which potentially do not generalize to the virtual worker population. Additionally, many of the studies investigating

effective virtual leadership use qualitative methods, warranting the need for more quantitative studies to replicate the findings. Finally, most of the research on virtual leadership behavior focuses on virtual teams. Studies have extensively examined team-level outcomes such as trust, coordination, and communication amongst team members (Bell et al., in press). Research has not focused enough on the dyadic leader-follower relationship and individual-level follower outcomes. More research is needed to understand the specific remote experience of different workers to better understand the nuances of how virtuality and leadership behavior influence individual followers' work experience.

### **Present Study**

The present study has three purposes. The first is to parse out the construct of virtuality by examining several characteristic variables of the virtual leader-follower relationship. I will attempt to uncover a holistic picture of the types of leader-follower working relationships that exist. To do so, I will examine the latent profiles of virtual workers to determine the dimensions on which virtual work happens, based on seven relationship characteristic variables of leader-follower dyads: geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader availability, and leader responsiveness. I will determine the most prevalent set of combinations of these variables in order to better understand the follower experience in today's work environments. The second purpose of this study is to address the mixed findings in the virtual leadership literature around which characteristics of the virtual work environment (e.g., geographic distance, technology usage, etc.) make leadership more or less effective. I will examine the relationship characteristic variables' relationships with five follower outcome variables: job satisfaction, commitment, engagement, performance, and perceived leader effectiveness in order to determine whether certain aspects of the virtual

working relationship differentially relate to the follower outcome variables. Finally, the third purpose of this study is to determine under which circumstances virtual work is beneficial versus problematic for the leader-follower relationship. As Bonet and Salvador (2017) state, “the fundamental research question is not whether manager-worker separation affects worker performance, but when and how it does so.” I will examine the interaction among the relationship characteristic variable profiles and traditional leadership behavior constructs (transformational, transactional, and destructive) on the follower outcome variables in order to better understand the circumstances under which leader behavior and the virtual work context interact to predict follower outcomes. I will attempt to parse out the mixed findings regarding whether virtuality augments, negates, or has no effect on the influence of leader behaviors on follower outcomes. This third purpose will address calls from Avolio et al. (2014) and Hambley et al. (2007) who argue that research has not focused enough on how leadership styles interact with virtuality to affect follower outcomes. Additionally, this will test Liao’s (2017) Proposition 12, at the individual level, which states: “The effects of leader behaviors on team and individual processes and outcomes are stronger in teams with high virtuality than in less virtual teams.”

This study will address several other limitations in the virtual leadership literature. First, by examining the full range of communication media used by followers, I will present findings based the most up-to-date technology currently utilized in the workplace, rather than a simplified operationalization of virtuality. Additionally, this study will examine leader behaviors’ influence at the individual level rather than the team level. It will also provide empirical evidence to supplement existing qualitative research, and it will utilize a sample of full-time workers to supplement findings from research on students in laboratory settings. This study will also examine destructive leadership’s interplay with virtual leadership, which has not been examined

to date. Findings will have implications for future research on the construct of virtual work in addition to applicable information for organizations seeking to optimize the virtual work environment by determining which leader behaviors and characteristics of the relationship context are helpful versus detrimental for follower outcomes.

**Relationship characteristic variables.** In the following sections, I outline the study variables and explain the reasoning behind their inclusion. First, I discuss the relationship characteristic variables, then the follower outcomes, and finally the leader behavior variables.

*Geographic distance.* Geographic distance is the most common operationalization of the virtual or remote work construct (Bell et al., in press), and it tends to be measured in several different ways. Some researchers look at geographic distance in miles (O’Leary & Cummings, 2007), some dichotomize the variable based on whether members of a dyad live in the same city (Kelley & Kelloway, 2012), some examine the amount of time a worker spends away from the office (Golden & Veiga, 2008), and some look at frequency of dyad contact (Neufeld, Wan, & Fang, 2010). Some of these operationalizations would better measure other relationship characteristic variables in this section, but their respective studies refer to them as physical distance. O’Leary and Cummings (2007) present a distance framework which defines team dispersion on three dimensions: spatial, temporal, and configurational. Spatial distance refers to the physical distance amongst team members, temporal distance refers to the extent to which they work during the same hours, and configurational distance refers to the number of different sites and extent of isolation experienced by team members. This framework highlights the fact that with geographical distance comes the complication of working in different time zones, and the fact that the virtual context varies across workers (e.g., virtual workers may be collocated with many others or be completely isolated). It is important to determine how to operationalize

the physical distance construct best, and to look at how it relates to other aspects of working remotely, especially if researchers continue to utilize distance as their sole operationalization of “virtual work.”

Research has produced mixed findings on the effects of working at a physical distance from one’s leader. Several studies reveal negative effects of leader distance, such as challenges coordinating work, problem solving, building trust, information sharing, and resolving conflict (Cramton & Webber, 2004; Hill, Bartol, Tesluk, & Langa, 2009; Hinds & Mortensen, 2005; Jarvenpaa & Leidner, 1999; Joshi et al., 2009). Podsakoff et al. (1996) found that leader-follower physical distance negatively affected follower performance, and Bonet and Salvador (2017) argue that the effect of leader-follower distance on follower performance depends on three variables: task complexity, collocation of follower with other followers, and leader’s experience as a manager. Some evidence exists in favor of geographic distance. For example, Henderson (2008) found that followers on dispersed teams were more satisfied with their leader. Connaughton and Daly (2004) found higher leader identification in distant team members compared to collocated team members, but also higher feelings of isolation. They argue that remote workers may not blame their leader for feelings of isolation and instead see isolation as an inherent part of working remotely.

Many studies examine physical distance as a moderator, some finding that it enhances the relationship between leader behavior and follower outcomes, and some finding that it attenuates it. In support of an augmentation effect, Gibson and Cohen (2003) found that leadership behaviors had a stronger relationship with team effectiveness on teams with higher geographic dispersion. Similarly, Orvis (2004) found stronger effects of leadership behavior (initiating structure, monitoring processes, and facilitating team cohesion) on team performance in

geographically dispersed teams compared to collocated teams. Howell, Neufeld, and Avolio (2005) also found a positive moderating effect for physical distance on the relationship between contingent reward leader behavior and business performance. One explanation for an augmentation effect is that distance potentially gives followers greater autonomy and empowerment, serving to build a trusting relationship with their leader (Bell et al., in press). In contrast, in support of an attenuation effect, Jawadi (2013) found that geographical distance negatively moderated the relationship between leadership coordination and relational behaviors and trust development with followers, and Torres (2018) found that followers of distant leaders reported lower trust in their leader than those of proximal leaders. One explanation for an attenuation effect is that physical distance makes it difficult to transmit influence or build the relationship foundation necessary to inspire followers over electronic communication (Neufeld et al., 2010). Howell and Hall-Merenda (1999) argue that distance between a leader and follower decreases the number of opportunities to directly influence, and Napier and Ferris (1993) argue that as the number of opportunities to observe followers decreases, their performance decreases. At the extreme, Kerr and Jermier (1978) argue that physical distance makes effective leadership behaviors impossible because it neutralizes their effect.

Some studies find no significant direct or moderating relationship between leader physical distance and follower outcomes (Bonet & Salvador, 2017). For example, Neufeld et al. (2010) found no relationship between leader-follower distance and perceived communication effectiveness nor leader performance, and argue that distance does not necessarily pose a barrier to communication in distant dyads. Similarly, Howell and Hall-Merenda (1999) found that distance did not moderate the effect of LMX behaviors on follower performance, and Barhite (2018) found that distance was unrelated to follower engagement and communication

satisfaction. In interviews conducted by Al-Ani et al. (2011), followers reported no advantages of working collocated with their leader, even though there were more communication challenges reported in distributed teams. Interviewees felt their ideas were heard from a distance and that they did not experience in-group/out-group dynamics. These findings suggest that there may be contingencies under which working at a distance does not have a negative effect, most likely due to communication tools, leader behavior (e.g., availability), and other aspects of the remote working experience that mitigate any negative outcomes that might typically come with distance. For example, Bonet and Salvador (2017) found task complexity to play a role in whether distance enhanced or hindered follower performance. They found that distance was negatively related to performance for tasks with high complexity, but that it was unrelated to performance for tasks with low complexity. They also found that the negative effects of distance were mitigated when followers were collocated with other team members. Given the differential outcomes that geographic distance produces in different situations, it seems important to measure additional contextual variables rather than physical distance alone.

***Communication medium.*** Another commonly examined dimension of the virtual work context is the medium used to interact. Communication media options continue to grow, with the main categories of face-to-face interaction, phone conversation, email, chat-based messaging, and video conferencing (Hoch & Kozlowski, 2014). Within these broad categories exist several variations of each type of media. For example, there exist a wide range of chat-based messaging products from which organizations can choose, from instant-messaging platforms that allow for text-based communication only, to interactive platforms that enable information sharing (e.g., file, folder, or video sharing). Additionally, variance exists in terms of video conferencing technology, with options like telepresence systems that create the experience of sitting across the

table from other meeting attendees via large screens and high-definition video, versus cellphone calling options that stream live video calls on a mobile phone screen.

Hambley et al. (2007) argue for more research on the ways in which technology use can enhance or negate leadership's effect on virtual work. Some evidence shows that leader-follower media choice matters, while some shows that it does not. Avolio et al. (2014) argue that electronic communication tools can either enhance or hinder a workers' ability to communicate and share information. The medium chosen can potentially distort intentions of a message (Robbins, 1998), such as the misinterpretation of an emotion over email. The choice of media can also impact how the leader and follower convey their presence to each other (Shuffler et al., 2016), which could result in a differential effects of leader behavior on follower outcomes based on the type of media used to communicate. Supporting this claim, Jawadi (2013) found that the use of communication technology positively moderated the relationship between leader coordination and relational behavior and trust development. In the virtual teams literature, choice of media has been shown to differentially affect outcomes. Hambley et al. (2007) found that team cohesion was higher in both face-to-face teams and teams that used videoconferencing compared to teams that used chat to communicate, and Wakefield, Leidner, and Garrison (2008) found that use of communication technology (i.e., conference calls, email, phone, fax, video conferencing, voicemail, and collaboration tools) reduced task conflict in virtual teams. Morgan, Paucar-Caceres, and Wright (2014) provide evidence against the influence of media choice, as they found that teams using a limited range of communication media did not have lower team effectiveness than those who had several media options. Barhite (2018) also found that team's use of virtual technology was unrelated to follower engagement. Most studies on the effects of

media choice examine virtual team dynamics rather than leader-follower dynamics, warranting more research on the role media choice plays in the dyadic relationship.

*Communication frequency.* In addition to media choice, another important variable is the frequency with which a leader and follower interact. Evidence shows that frequent communication can enhance task completion, and that it is even more important in virtual contexts compared to collocated ones (Schmidt, 2014; Zigurs, 2003). Cascio and Shurygailo (2003) argue that a common mistake made by leaders is to rely on the existence of communication technology to make followers consider them available rather than proactively initiating interactions. Electronic media arguably make it even easier to frequently interact with followers than relying solely on face-to-face interaction, with the ability to send messages when others cannot engage in person (Avolio & Kahai, 2003). Cummings (2008) states that frequent, informal interaction is the key success factor to leading distributed teams, and a common argument is that communication frequency can “reduce” distance or mitigate the potential negative outcomes of not working collocated (Torres, 2018). Empirical evidence supports this claim, as one study showed that frequent, unplanned, and informal communications mitigated the effect of team dispersion on conflict (Connaughton, Shuffler, & Goodwin, 2011). Additionally, frequent communication in virtual teams has been shown to have a positive direct effect on follower satisfaction and trust in leader (Kelley & Kelloway, 2012). As noted previously, distance can make it difficult for leaders to translate influential behaviors, but researchers argue that engaging in frequent interaction can increase leaders’ ability to engage in such behaviors and in turn strengthen their effects. Kacmar, Witt, Zivnuska, and Gully (2003) argue that leaders can augment the positive effects of LMX via frequent communication with followers, and Gajendran and Joshi (2012) provide evidence that communication frequency positively moderates the effect

of LMX behavior on individual team member influence on team decisions, which in turn positively predicts team innovation. These findings suggest that virtual leaders may need to expend more effort engaging in particular behaviors than collocated leaders to produce a similar effect. Walther (2008) posits that communication frequency contributes to positive LMX results because it allows for more relationship building and social, non-task interaction. Limited evidence shows that communication frequency does not matter in the leader-follower relationship, but Barhite (2018) found no relationship between frequent leader-follower communication and follower engagement.

An important implication for measuring communication frequency is that follower attributions of frequency are subjective. That is, followers vary in their desire for frequent communications and the extent to which they perceive particular amounts of communication as frequent or infrequent. Antonakis and Atwater (2002) argue that followers' perceptions of their interaction frequency with their leader will directly influence how they view the leader. Frequent interaction is not always the best, and it depends on followers' interpersonal preferences in addition to the extent to which they need work-related guidance. Leaders must determine the extent of communication frequency that works for each follower and then balance meeting differential follower needs. Connaughton et al. (2011) state that "researchers run the risk of minimizing the complexities of communication by saying that it should be 'regular'" (pp. 506). More clarity is needed around the optimal degree of communication frequency in virtual leader-follower dyads, and it will likely be influenced by other contextual variables such as physical distance and media choice.

**Media richness.** Media richness pertains to the quality and ease with which information can be shared via electronic media (Daft & Lengel, 1986). Daft and Lengel define four

components of media richness, which are the abilities to: send multiple verbal and nonverbal cues, use natural language, give and receive immediate feedback, and convey feelings and emotions. Robbins (1998) added that media richness is the ability to deliver multiple cues simultaneously. Examples of nonverbal cues are body language, physical posture, and facial expressions. Telepresence video conferencing is an example of rich media because it allows for the communication of many simultaneous cues and immediate back-and-forth conversation using natural language and displays of emotion. Text messages are an example of media low in richness because they cannot transmit nonverbal cues, feedback is not necessarily immediate, and they can distort emotions.

Most research on media richness in the virtual leadership literature finds that it contributes to follower outcomes. Low media richness can potentially attenuate leader influence (Dulebohn & Hoch, 2017) and the degree of media richness has been found to influence the extent to which virtual teams develop trust (Avolio, Kahai, Dumdum, & Sivasubramaniam, 2001). High media richness predicts team performance and trust (Burgoon et al., 2002), and has been shown to increase communication frequency in teams (Martins et al., 2004). Huang, Kahai, and Justice (2010) examined media richness as a moderator to the effects of transformational and transactional leadership on team outcomes. They found that on teams with low media richness, transformational leadership increased cooperation amongst team members and transactional leadership increased task cohesion. On teams with high media richness, neither transformational nor transactional leadership influenced these outcomes. The authors posit that technology's ability to facilitate team communication plays a role in whether leader behavior influences team outcomes, and that with rich media, leadership might have less influence because technology acts as its substitute (i.e., technology facilitates team cooperation and cohesion more than leader

behavior does). In contrast, Hambley et al. (2007) found no effect of media richness on team task performance. More research is needed on the role media richness plays in the leader-follower dyad relationship, in addition to how to interact with other contextual variables.

***Synchronicity.*** Synchronicity refers to the extent to which communication occurs in real time with immediate responses versus being spread out over time (Dennis & Valacich, 1999). Face-to-face, phone, and telepresence conversations are examples of synchronous communication because responses occur live in real-time. Email is an example of asynchronous communication because it can take days or weeks to receive a response. Most media vary in their degree of synchronicity, and organizations tend to have norms around the synchronicity of communication (Carter et al., 2015). For example, norms may dictate whether individuals respond immediately upon receiving a chat-based message, or whether they treat the platform like email and respond with more of a delay. Many studies examining synchronicity operationalize it based on the form of media (e.g., categorize video conference as synchronous and email as asynchronous), but do not take into the account the idiosyncrasies around the synchronicity with which individuals use technology (i.e., some workers may respond synchronously to emails). Higher synchronicity is not always better, as some tasks likely require quick responses while others do not, and may even benefit from delay giving individuals time to think about a response or to find the necessary information they need to share. Evidence shows that complex tasks that require interdependence and immediate feedback benefit from more synchronous communication (Bell & Kozlowski, 2002). For example, chat-based messaging has been shown to be more effective than email for tasks that require continual information sharing and constant collaboration (Balthazard, Waldman, Howell, & Atwater, 2002; Bell & Kozlowski,

2002). However, for less complex tasks that require less interdependence, asynchronous communication can be sufficiently effective (Bell & Kozlowski, 2002).

Synchronicity of communication plays a role in work-life balance for leaders and followers. When employees are always reachable and synchronous communication is expected, they can experience negative outcomes such as work-life balance issues and face challenges managing their workload due to distraction and information overload (Butts, Becker, & Boswell, 2015). Research is lacking on synchronicity of communication in the virtual leadership literature, and more work is needed to determine the degree of synchronicity that is most effective.

**Leader availability.** Another important variable in the virtual relationship context is the extent to which followers perceive their leader to be available. Even if the best communication mechanisms are in place, if followers do not feel that they can reach out to their manager when needed, then communication media likely will not be effective. Leader availability increases opportunities for timely feedback, guidance, and relationship building (Avolio et al., 2014). It is one of the three dimensions in Brown's (2017) definition of leader approachability, which is comprised of a leader's degree of availability, warmth, and receptivity. Brown argues that without making themselves available, leaders cannot be considered approachable.

Approachability, and availability specifically, create opportunities for social and work-related interaction, which allow for more leader behaviors that can motivate followers and communicate important work-related information (Northouse, 2012). Additionally, leader availability means that followers have more opportunities to share information upward, making it easier for leaders to monitor performance. Enhanced interpersonal relationships are also a likely outcome of leader availability (Brown, 2017). Research shows that followers of approachable leaders tend to voice their opinions more (Saunders, Sheppard, Knight, & Roth, 1992), and that followers who

perceive their leader to be open experience higher psychological safety (Detert & Burris, 2007). Additionally, Connaughton and Daly (2004) found that perceived leader accessibility was related to followers' identification with their leader.

In virtual work environments, leader availability can potentially be more challenging to convey. In a collocated setting, a leader can use nonverbal cues like leaving the office door open or by completing work out on the floor with the team. Leaders likely need to concert more effort to communicate their availability in virtual environments, such as emphasizing that followers can email or call them when they need to talk. Leaders can also use mechanisms like recurring "1-on-1" meetings with their followers each week (via phone or video) to make themselves available to their followers. Cascio and Shurygailo (2003) argue that regularly scheduled "1-on-1" conversations may be even more important for virtual followers than collocated followers because they may be the only point of interaction that a follower has with his/her leader that week or month. Behaviors like canceling or re-scheduling meetings may have negative effects on trust and attenuate any positive effects of a leader's messaging of being available. More research is needed to examine the relationships among leader availability and the other aspects of the remote work relationship.

***Leader responsiveness.*** In addition to making themselves available, it is important for leaders to be perceived as responsive. A leader who tells his/her followers to reach out any time, but then does not respond to their messages or has extremely delayed responses, likely will negate any benefits that might come from emphasizing availability. Additionally, even the best communication technology would be ineffective if a leader did not respond to follower messages. Responding quickly to followers can facilitate leaders' convention of both initiating structure and consideration behavior. Avolio et al. (2014) argue that a fast response by a leader to

give work guidance can also communicate individual consideration and investment in his/her development. Timmerman and Scott (2006) found that leader responsiveness related to virtual team identification with leader, trust, and communication satisfaction.

With access to work communication on mobile devices and the ease with which followers and leaders can contact one another, researchers argue that technology is actually making it more challenging for leaders to be responsive, especially if they have followers working in many different time zones (Avolio & Kahai, 2003). Constant pressure to respond can have negative effects for leader stress, work-life balance, and burnout, in addition to slowing the leader's productivity because of the distraction and unpredictability that come with fielding follower messages (Avolio et al., 2014). Spending extensive time responding to follower messages might also deter a leader from engaging in particular leadership behaviors, illustrated by Rosen et al.'s (2018) findings that high email demands related to a lack of perceived goal progress for leaders, which led them to engage in less initiating structure and transformational leadership behaviors. More research is needed to understand how responsiveness relates to other aspects of the virtual leader-follower working relationship.

***Research question 1.*** Because there is some potential overlap in the relationship characteristic variables listed above, and because the virtual context has been operationalized in many ways, I will first conduct a Latent Profile Analysis (LPA) to investigate how latent profiles of virtual workers are defined by the seven relationship characteristic variables. Determining the most prevalent combinations of the relationship characteristic variables will provide a more holistic picture of what it means to work at a distance from one's leader rather than looking at different operationalizations of virtual work in turn. For example, a potential profile might contain workers who report high degrees of communication frequency, synchronicity, and leader

responsiveness, which could be indicative of “high interaction,” while another profile might contain workers who report low levels of these variables, which could be defined as “low interaction.” Examining latent profiles will also provide information on how geographic distance coincides with the other relationship characteristic variables, which might explain some of the mixed findings in terms of whether distance is positive or negative for the leader-follower relationship. For example, there might be a class with high geographic distance but beneficial levels of other variables (e.g., high responsiveness, rich media use), and another class with high geographic distance and detrimental levels of the other variables (e.g., low responsiveness, low degree of media richness). In sum, examination of the ways that relationship characteristic variables define the types of leader-follower dyads that exist will allow for parsing out the construct of virtuality and the ways in which it shows up in work contexts today.

*Research question 1:* What unique patterns of leader-follower relationship characteristics exist in leader-follower dyads?

**Follower outcome variables.** Several outcome variables have been examined in the virtual leadership literature. Using different outcome measures can make it difficult to make one conclusion on effective versus ineffective virtual leadership behavior, and to compare findings across studies in terms of what aspects of the virtual relationship matter. I will examine five variables that are commonly studied as outcomes of leadership in order to expand knowledge on the ways in which characteristics of the virtual environment affect different follower outcomes. The five follower outcomes are outlined in the following section.

**Job satisfaction.** Job satisfaction is a job attitude comprised of both affective and cognitive evaluations of one’s job (Judge, Thoreson, Bono, & Patton, 2001). The affective component refers to the degree of pleasure one feels from his/her job, and the cognitive

component refers to his/her perception of whether the job fulfills his/her needs and preferences. Leadership behavior has been shown to predict job satisfaction, and there tends to be a stronger link between consideration leader behaviors and job satisfaction than initiating structure behaviors (Judge et al., 2004). In virtual work environments, job satisfaction has been shown to relate to transformational leadership (Kelley & Kelloway, 2012; Purvanova & Bono, 2009) in addition to relationship characteristic variables such as geographical distance and communication frequency in teams (Kelley & Kelloway, 2012).

***Commitment.*** Commitment is another job attitude which can be defined as “a force that binds an individual to a course of action of relevance to one or more targets” (Meyer & Herscovitch, 2001, pp. 301). It is a multidimensional construct comprised of three distinct mindsets: affective, continuance, and normative commitment. In this study, the target of commitment will be the organization (i.e., the extent to which an individual feels bound to the organization, or desires to remain in his/her current job). Affective commitment refers to the most internalized form of commitment, wherein an employee fully identifies with the organization and has a desire to remain working there (Meyer & Herscovitch, 2001). Normative commitment refers to more of an obligation to stay in the organization based on social norms and expected allegiance, and continuance commitment is the least internalized form, in which an employee remains in an organization because of the perceived costs of leaving (e.g., losing pay and benefits; Meyer & Herscovitch, 2001). The three dimensions of commitment tend to have similar directional relationships with outcome variables, but to varying degrees of strength, with affective commitment tending to be most predictive of performance, turnover, and other outcomes. Affective commitment has been found to relate to job performance, organizational citizenship behaviors, and retention (Schleicher, Hansen, & Fox, 2011). Follower commitment

has been shown to strengthen as a result of inspirational leadership in dispersed teams (Joshi et al., 2009), in addition to be more positively affected by LMX in virtual compared to collocated teams (Golden & Veiga, 2008). In line with other research on commitment in the virtual leadership literature, this study will focus on affective commitment as an outcome variable.

**Engagement.** Engagement can be defined as a focused energy directed toward organizational goals (Macey, Schneider, Barbera, & Young, 2009), or as an “active, positive work-related state that is characterized by vigor, dedication, and absorption” (Schaufeli & Bakker, 2004, pp. 295). Vigor refers to high levels of energy and mental resilience, dedication refers to feelings of significance, enthusiasm and challenge with work, and absorption refers to full concentration and engrossment in work, making time pass quickly (Bakker, 2011). Engaged employees are likely to put forth more discretionary energy and work harder than employees who are not engaged (Bakker, 2011). Bakker (2011) distinguishes engagement from satisfaction by arguing that engagement is a more active attitude whereas satisfaction is more passive. Engagement has been found to predict job performance, positive emotions, and well-being (Bakker, 2011). In the virtual leadership literature, engagement has generally been shown to be unrelated to whether a follower works remotely (Barhite, 2018; Fisher, 2014). These findings could be due to the fact that engagement is more controlled by the follower (because it is active) and may be more influenced by individual characteristics than the more passive outcome of satisfaction which might be more prone to influence from external variables.

**Job performance.** Job performance is the ultimate criterion of interest for organizations but also one of the most difficult to measure. It is comprised of three components: task performance, organizational citizenship behavior, and counterproductive work behavior (Rotundo & Sackett, 2002). This study will focus on task performance, which can be defined as

those behaviors formally recognized as part of one's job that contribute to the organization's technical core (Borman & Motwoidlo, 1993). Individual job performance has been shown to predict organizational performance, satisfaction, and retention (Meyer, Becker, & Vandenberghe, 2004). It is commonly studied as an outcome of effective leadership. In the virtual leadership literature, there have been mixed findings around how a virtual work context affects follower performance. Transformational leadership has been shown to affect performance more so in collocated teams compared to virtual teams (Howell et al., 2005), but contingent reward leader behavior has been shown to more strongly influence performance on virtual teams (Bell et al., in press).

***Leader effectiveness.*** Leader effectiveness is the overall perceived performance of a leader, and it is a commonly measured construct when determining which aspects of leader behavior are most important (Barling, Cristie, & Hopton, 2011). Followers' perceptions of leaders' initiating structure and consideration behaviors have been shown to predict ratings of leader effectiveness, with consideration ratings being slightly more predictive (Judge et al., 2001). Antonakis and Atwater (2002) argue that a follower's perception of leader effectiveness hinges on the leader's ability to match the degree of distance a follower desires in a given context. As reviewed above, many researchers have claimed a virtual work environment may pose challenges for effective leadership, and there is potential for the virtual context to either enhance or negate leader effectiveness (Avolio et al., 2014).

***Research question 2.*** To determine which types of the virtual context are most important, I will examine the relationships among the relationship characteristic variables and the follower outcomes. Examining each relationship in turn will reveal which particular aspects of the virtual environment are most related to particular follower outcomes, so that more specific conclusions

can be drawn around what makes leadership effective when working remotely. This will address mixed findings due to studies that only examine one or two follower outcomes.

*Research question 2:* How do characteristics of the leader-follower relationship (geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader availability, leader responsiveness) relate to follower (a) job satisfaction, (b) commitment, (c) engagement, (d) job performance, and (e) leader effectiveness?

**Leadership behavior variables.** Finally, to address the call for examining how leadership behaviors interact with the virtual environment to predict follower outcomes, I will examine established leader behaviors that are known to be beneficial and detrimental for followers: transformational, transactional, and destructive leadership.

**Transformational leadership.** Transformational leadership, the process by which leaders appeal to the emotions of followers in order to produce higher performance, has been shown to produce several beneficial outcomes including job satisfaction, motivation, and performance (Bass, 1985; Lowe, Kroeck, & Sivasubramaniam, 1996). Some research shows a positive direct relationship between transformational leadership and follower performance in virtual environments (Wotjara-Perry, 2017; Lewandowski & Lisk, 2012). There have been mixed findings on the interaction between the virtual work context and transformational leadership on follower outcomes. Some studies find that virtuality attenuates the effects of transformational leadership, acting as a boundary condition of its effects (e.g., Howell et al., 2005), while some find that virtuality strengthens the relationship between transformational leadership and follower outcomes (e.g., Schmidt, 2014). The explanation for an attenuating effect is that in virtual work environments, it is likely more challenging for leaders, and they also have less opportunities, to

convey transformational leadership to their followers at a distance and via technology (Bell et al., in press; Shamir, 1995). The explanation for an augmentation effect is that in the virtual environment, behaviors of the leader become more important and influential in the absence of other work cues. Davis et al. (2003) found that compared to transactional and laissez-faire leaders, transformational leaders had more effective and committed virtual teams. Huang et al. (2010) found that transformational leadership enhanced cooperation in virtual teams using technology low in media richness, and Johnson (2013) found that teams with transformational leaders tended to be more satisfied than teams with transactional leaders in dispersed Navy Special Operations teams. Kelley and Kelloway (2012) found that transformational leadership mediated the effect of contextual variables (perception of control, prior knowledge about leader, unplanned communications, regularly scheduled communication) on follower outcomes (job satisfaction, commitment, and trust) in virtual teams, but not in proximally located teams, indicating that transformational leadership was more important in the virtual environment. Purvanova and Bono (2009) also found support for the claim that transformational leadership behaviors are more influential in virtual settings. They studied leadership behavior longitudinally, and found that the most effective leaders (i.e., leaders of the highest performing teams) were those who increased their degree of transformational leadership over time. They concluded that the sense of uncertainty and ambiguity inherent to the virtual setting creates an opportunity for transformational behaviors to influence followers. They argue that leadership behaviors are even more important in virtual settings because there is a greater opportunity to influence in a virtual team versus a collocated team due to the social and psychological uncertainty and reduced noise from other potential influential variables.

In contrast, some support exists for the claim that distance attenuates transformational leadership's effect. Howell et al. (2005) found that transformational leadership positively predicted team performance in proximal teams, but not in dispersed teams. Howell and Hall-Merenda (1999) also found that transformational leadership was more predictive of follower performance in collocated teams compared to dispersed teams. Huang et al. (2010) found that in teams using communication technology high in media richness, transformational leadership did not predict performance. They argue that the influence of leadership is attenuated when media is rich enough for seamless communication and information sharing amongst team members. More research is needed to understand the ways in which transformational leader behaviors interact with aspects of the virtual environment to influence followers' work experience.

***Transactional leadership.*** Transactional leadership, or the process of motivating followers via an exchange process of rewards for performance (i.e., recognition, explaining incentives, rewarding good performance) has been shown to produce beneficial outcomes such as follower job satisfaction and performance (Lowe et al., 1996). This paper will focus specifically on contingent reward behavior because it is the most predominantly studied in previous literature. Some researchers argue that transactional leadership can enhance follower outcomes in the virtual environment because it means that leaders are setting structure for their followers and removing work ambiguity (Bell et al., in press). However, an alternate argument is consistent with that for transformational leadership behaviors, stating that distance or communicating via technology can attenuate the effects of transactional leadership because it dampens leaders' ability to convey these behaviors. Antonakis and Atwater (2002) argue that followers of distant leaders may view them as less active, and Howell and Hall-Merenda (1999) argue that distance can make it more difficult to observe behavior and provide timely

recognition. Evidence exists for both an augmentation and attenuating effect. In favor of transactional leadership's effects in virtual work settings, contingent reward leader behaviors have been shown to more positively predict follower performance when leaders are located at a distance versus collocated (Bell et al., in press). Additionally, Zhang et al. (2009) found that leader delegation was associated with higher follower satisfaction and motivation in dispersed teams. Huang et al. (2010) found that transactional leadership was associated with high task cohesion in virtual teams that were using technology low in media richness. Howell et al. (2005) found that distance positively moderated the relationship between contingent reward leader behaviors and follower performance. However, when the teams utilized media high in richness, the effect of transactional leadership was neutralized, indicating that effective technology may negate the amplified importance of leadership in virtual environments. In addition, Podsakoff, Todor, Grover, and Huber (1984) found that distance negatively moderated the effect of contingent reward behavior on follower performance.

Finally, some research shows that the combination of transactional leadership with transformational leadership is most effective in virtual teams. Moore (2008) found the combination of transactional and transformational leadership behaviors resulted in higher virtual team motivation, and Zayani (2008) found that the pairing of both leadership behaviors predicted team performance.

***Destructive leadership.*** Destructive leadership, or leader behaviors that harm or intend to harm an organization and/or its members, has been shown to negatively affect follower satisfaction, performance, well-being, and retention (Craig & Kaiser, 2011). Destructive leadership has not been explored in the virtual leadership literature. Studies tend to focus on how positive leadership behaviors affect follower outcomes in virtual environments, but fail to

examine the potential negative effects, or even more extreme negative effects, that might result from working for a destructive leader in a virtual environment.

*Research question 3.* To answer the call to investigate how aspects of the virtual work environment interact with leader behaviors, I will examine the relationship characteristic variables as moderators in the relationship between leadership behaviors and follower outcomes. Specifically, I will utilize relationship characteristic profile membership (identified from Research Question 1) as a moderator variable in the relationship between leader behaviors and follower outcomes. This will help determine under which circumstances transformational and transactional leadership can be particularly effective in addition to the circumstances under which destructive leadership can be particularly detrimental for follower outcomes.

*Research question 3:* Does leader-follower relationship profile (comprised of geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader approachability, and leader responsiveness) moderate the relationship between leadership behaviors (transformational, transactional, and destructive leadership) and follower outcomes (job satisfaction, commitment, engagement, job performance, perceived leader effectiveness)?

**Contributions summary.** In sum, the proposed study will accomplish three goals. This study will holistically examine what it means for a follower to work at a distance from his/her leader by determining the types of leader-follower relationship dynamics that exist. Additionally, this study will examine how relationship characteristic variables differentially relate to follower outcomes. Finally, this study will examine how different types of leader-follower relationship dynamics interact with generally beneficial and generally detrimental leader behaviors for follower outcomes.

## Method

### Participants

Participants will be approximately 700 Mechanical Turk (MTurk) workers. This sample size was chosen based on three criteria. First, I conducted a power analysis using G\*Power for the relative weights analysis that I intend to conduct, which indicated that for a linear multiple regression with seven predictors, in order to detect effect sizes of .15 with .95 power, the minimum required sample size is 153. Second, I utilized findings from Sheih's (2018) investigation of required sample sizes to determine differences in simple slopes when testing for an interaction between a continuous and categorical variable (which I intend to test). For a categorical variable with unbalanced groups, a sample size of 168 (with groups sized 21, 42, 42, 63), Sheih demonstrated capability to identify effect sizes of .07 with power of approximately .80. Finally, to determine the appropriate sample size for the LPA, I referred to Tein, Coxe, and Cham's (2013) investigation of the sample size requirements to correctly identify the number of classes in an LPA. They found that *Cohen's d* of .8 between classes could be identified with a sample size of at least 500 with ten indicators. They also reviewed LPA methodology in the literature and found that between January 2007 and March 2010, the median sample size utilized for an LPA was 377, with a range from 79 to 5,183. Based on these findings, I intend to collect a sample size of at least 500. Given the likelihood of removing participants due to careless responding, I will collect from 700 participants to ensure I reach my sample size minima.

Inclusion criteria will require participants to be at least 18 years old, reside in the United States, work at least 30 hours per week, report directly to a manager at work, and have reported to that manager for at least one month. They will receive \$0.75 as compensation for completing the study. I will use instructed-response items, survey response time, and Maximum LongString

careless response indicators to remove participants from analyses who display careless responding. I will follow procedures outlined by Meade and Craig (2012) and Francavilla, Meade, and Young (2018) to compute these indices.

### **Procedure**

Participants will first complete a set of demographic items. Then they will complete a set of relationship characteristic scales, followed by follower outcomes scales, and then leadership behavior scales.

**Demographics.** Participants will report their age, gender, nationality, work role, industry, job tenure, income range, education level, and the tenure of time they have reported to their manager. They will also report their manager's gender and nationality. Finally, they will indicate whether their company is global, multi-national, national, regional, state, or local. Two other demographic variables will be examined.

***Perceived degree of virtual work.*** Following previous research (e.g., Golden & Veiga, 2008; Wiesenfeld, Raghuram, & Garud, 1999), I will measure participants' degree of engagement in virtual/remote work in two ways. First, participants will provide the proportion of time they spend working virtually away from an office in an average work week. They will also report the total number of hours they work per week, and the number of hours they spend working virtually away from an office in an average week.

***Time zone difference.*** To determine time zone differences between participants and their managers, participants will be asked to provide the primary city in which they work and the primary city in which their manager works. Time zone differences will be computed based on the primary locations. Additionally, participants will be asked to report the hours in which they typically work on a given day (i.e., the time they start and end their work day). They will also be

asked to estimate these times for their manager. I will examine the total number of work hours of overlap between participants and their managers.

**Study variables.**

*Relationship characteristics.* Participants will be asked to complete the following scales about their work context and their interactions with their manager.

*Geographic distance.* Geographic distance will be examined in three ways. First, physical distance in miles will be calculated using the reported follower and leader primary city locations (O’Leary & Cummings, 2007). I will convert these responses to an ordinal variable by creating normed buckets of distances (i.e., the first bucket could potentially be “located within 0-30 miles from leader”). Second, I will utilize Howell and Hall-Merenda’s (1999) adaptation of Klaus and Bass’ (1982) single item which asks participants to rate their physical proximity to their manager on a 5-point scale ranging from 1 (*very close—i.e., same floor, within 100 ft or 30 miles*) to 5 (*very distant—i.e., different city*). Finally, I will utilize an operationalization similar to Merriman et al. (2007) which asks participants to rate on a 5-point agreement scale whether they typically work at the same address as their manager.

*Communication medium.* To measure communication medium, I will provide respondents an extensive list of communication media (e.g., text message, email, phone call, Skype video call, Webex video call, etc.) and ask them to indicate whether they ever use each medium to communicate with their manager. I will also provide a space for participants to write in responses that are not provided on the list.

*Communication frequency.* To measure communication frequency, I will use survey logic so that when participants indicate that they use a medium to communicate with their manager, they will then be prompted to indicate the frequency with which they use that medium to

communicate with their manager on a scale from 1 (*once or twice in the last six months*) to 5 (*many times daily*). These anchors are based on those used by Hoch and Kozlowski (2014) and Kacmar et al. (2003). Participants will also estimate the proportion of total time spent communicating with their manager via each medium. Survey logic will require their reported proportions to sum to 100. Participants will also provide overall ratings of their communication frequency with their manager on a 4-item scale adapted from McAllister (1995). An example item is “How frequently does your manager initiate work-related interaction with you?” Response options will be on the same frequency rating scale described above.

*Media richness.* Media richness will be measured using an adaptation of Carlson and Zmud’s (1999) perceived media richness scale. Participants will be asked to respond based on the general richness of communication media they use in their job. An example item is “The technology I use to communicate with my manager allows my manager and me to use rich and varied language in our messages.” Response options will be on a Likert-type agreement scale from 1-5.

*Synchronicity of communications.* Participants will report the proportion of their communications with their manager that are synchronous (i.e., they respond immediately back and forth) versus asynchronous (i.e., they have time delays in their responses to each other), with a requirement that the two responses sum to 100. Based on the distribution of reported synchronicity, I will compute either a dichotomous or ordinal variable that represents different levels of synchronicity.

*Leader responsiveness.* Participants will estimate how quickly their manager typically responds to them when they initiate an interaction on a scale from 1 (*within seconds*) to 5 (*after 1 week*). They will also fill out a scale developed for this study that measures general leader

responsiveness with items like “When I send my leader a message, I know he/she will respond,” and “My manager ignores my emails” (reverse coded).

*Leader availability.* Leader availability will be measured using the availability subscale of the Leadership Approachability Scale developed by Brown (2017). An example item is “My supervisor keeps an ‘open-door’ policy for meeting with employees as needed.” Response options will be on a Likert-type agreement scale from 1-5.

*Follower outcomes.* After the relationship characteristics scales, participants will complete the following scales about their work attitudes and performance. All items will have response options on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*) unless otherwise noted.

*Job satisfaction.* Job satisfaction will be measured using Cammann, Fichman, Jenkins and Klesh’s (1983) 3-item scale from the Michigan Organizational Assessment Questionnaire. Bowling and Hammond (2008) conducted a meta-analysis providing reliability and construct validity evidence for this measure of job satisfaction. An example item is “All in all I am satisfied with my job.”

*Commitment.* Affective commitment will be measured via Allen and Meyer (1990)’s 8-item Affective Commitment Scale. An example item is “I would be very happy to spend the rest of my career with this organization.”

*Engagement.* Engagement will be measured via the 9-item Utrecht Work Engagement Scale–9 (Schaufeli, Bakker, & Salanova, 2006) which includes three subscales measuring vigor, dedication, and absorption. An example item from the vigor subscale is “When I get up in the morning, I feel like going to work.”

*Job performance.* To measure job performance, I will use a scale developed by Abramis (1994) which measures self-reported technical job performance. The scale asks respondents to report on how well they handle responsibilities, make decisions, make mistakes, and get things done on time. An example item is “In the last week, how well were you handling the responsibilities and daily demands of your work?” Response options will be on a scale from 1 (*very poorly*) to 5 (*very well*). Additionally, participants will indicate how they would expect their manager to rate their performance on a scale from 1 (*poor*) to 5 (*excellent*).

*Leader effectiveness.* Leadership effectiveness will be measured using a single-item measure from the Leadership Versatility Index ® (LVI; Kaplan & Kaiser, 2003), which asks participants to rate their manager’s overall effectiveness on a 10-point scale. Kaiser, Overfield, and Kaplan (2010) demonstrated the validity of this single-item measure.

*Leader behavior.* Participants will fill out the following scales about the behavior of their manager. Response options will be on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*) unless otherwise noted.

*Transformational leadership.* Participants will rate the transformational leadership behavior of their manager using Podsakoff, MacKenzie, Moorman, and Fetter’s (1990) 23-item Transformational Leadership Inventory. An example item is “My manager has a clear understanding of where we are going.”

*Transactional leadership.* Participants will rate the transactional leadership (contingent reward) behavior of their manager using Podsakoff et al.’s (1984) 10-item contingent reward subscale from the Leader Reward and Punishment Questionnaire. An example item is “If I do well, I know my supervisor will reward me.”

*Destructive leadership.* Participants will rate the destructive leadership behavior of their manager using a 16-item scale that was derived based on findings from Mullins (2015). Mullins conducted a factor analysis of the existing prominent destructive leadership scales. Based on the factor loadings reported by Mullins on a destructive leadership factor, interpretability, and non-repetitiveness, Young, Francavilla, and Andrews (2016) selected 16 items to utilize as a reduced destructive leadership scale. The scale consists of items from Tepper's (2000) abusive supervision scale and Ashforth's (1987, 1994) petty tyranny scale. Results of factor analyses conducted by Young et al. and by Francavilla (2016) in a subsequent study provide evidence for the unidimensionality of the scale and show that it demonstrates high internal consistency reliability ( $\alpha = .96, .96$ ). An example item is "My manager reminds me of my past mistakes and failures." Response options will be on a frequency scale from 1 (*never*) to 5 (*always*).

### **Proposed Analyses**

**Research question 1.** Research question 1 asks: *What unique patterns of leader-follower relationship characteristics exist in leader-follower dyads?* I will address this question by conducting an LPA using responses to the items corresponding to the seven relationship characteristic constructs (geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader responsiveness, and leader availability) to determine the number and pattern of unique combinations of the leader-follower relationship characteristic variables that exist amongst respondents. Before conducting the LPA, I will need to determine how to best combine the different measures I utilize for each relationship characteristic variable (i.e., I plan to measure geographic distance in three ways, and I will need to determine how to combine these measures into one geographic distance score to include in my LPA). I will first conduct individual Exploratory Factor Analyses (EFA) on each

of the relationship characteristic variable measures. Then, in order to combine the distinct geographic distance measures (and other relationship characteristic variables that I plan to measure in more than one way), I will compute their z-scores, and then average their z-scores to compute a single geographic distance score. To determine the number of latent profiles present in the LPA, I will examine the Lo-Mendell-Rubin likelihood ratio test, bootstrap likelihood ratio test, entropy (i.e., distinctiveness between classes), Akaike's Information Criterion, Bayesian Information Criterion, sample size adjusted Bayesian Information Criterion, and interpretability of the classes (Nylund, Asparouhov, & Muthén, 2007).

**Research question 2.** Research question 2 asks: *How do characteristics of the leader-follower relationship (geographic distance, communication medium, communication frequency, media richness, synchronicity of communication, leader availability, leader responsiveness) relate to follower (a) job satisfaction, (b) commitment, (c) engagement, (d) job performance, and (e) leader effectiveness?*

I will examine this question in three ways. First, I will examine the correlations between each relationship characteristic variable and each follower outcome variable. Second, I will conduct relative weights analyses (Johnson, 2000) on the set of relationship characteristic variables on each of the outcome variables. For example, I will conduct a relative weights analysis using all seven relationship characteristic variables as predictors on job satisfaction as an outcome, and then on commitment as an outcome, etc. Finally, I will also examine this question by computing the mean scores on the outcome variables for each identified relationship characteristic latent profile from Research Question 1. I will display these results in a boxplot.

**Research question 3.** Research Question 3 asks: *Does leader-follower relationship profile (comprised of geographic distance, communication medium, communication frequency,*

*media richness, synchronicity of communication, leader approachability, and leader responsiveness) moderate the relationship between leadership behaviors (transformational, transactional, and destructive leadership) and follower outcomes (job satisfaction, commitment, engagement, job performance, perceived leader effectiveness)?* I will investigate this question by looking at relationship characteristic latent profile membership (identified in Research Question 1) as a moderator to the leader behavior-follower outcome relationship. Relationship characteristic latent profile will be treated as a nominal categorical variable and it will be dummy coded. Following recommendations from Aiken and West (1991), I will conduct a multiple regression with latent profile membership, leader behavior, and their interaction as predictors of follower outcome. I will run a model for each combination of the leader behavior variables with the follower outcomes (e.g., one model for the relationship between transformational leadership and follower satisfaction, one model for the relationship between transformational leadership and follower commitment, etc.), each with relationship profile membership as the other predictor variable. If the analyses indicate a significant overall interaction between profile membership and leader behavior, I will probe the nature of the interaction by looking at the simple slopes. I will first test that the simple slopes for the regression of leader behavior on follower outcomes for each profile differs from zero. Then, I will take pairs of profiles in turn and test for differences in a predicted value of the follower outcome for a specific value of leader behavior. I will also examine plots of the simple slopes to explicate the nature of the interaction.

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