

Co-Leader Relationships and the Impact on Team Functioning

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Abstract of Dissertation

Co-Leader Relationships and the Impact on Team Functioning

Co-leadership is becoming a more popular and prominent leadership structure across a variety of industries and settings; however, the body of knowledge on this topic is limited. Much of the current research focuses on whether co-leadership is a beneficial or detrimental form of leadership and there exists a gap in our knowledge about how and when co-leadership is or is not successful. The current study aims to fill this gap by surveying a group of 48 U.S. Army co-leader dyads and their direct superiors and subordinates on antecedents and outcomes of this co-leader relationship. Results demonstrate that engaging in effective co-leader processes such as participative decision-making, willingness to learn from each other, and supporting and empowering each other was related to higher quality co-leader relationships. Additionally, participative decision-making and communication quality were related to co-leader effectiveness. Results also revealed that each member of the co-leader dyad may view these antecedents of relationship quality differently. Further, positive co-leader processes and interactions were related to key outcomes such as co-leader effectiveness and team effectiveness. Unexpectedly, co-leader relationship quality was not related to co-leader effectiveness nor team effectiveness and level of dyadic congruence on these antecedent processes was not related to relationship quality. Overall, these findings suggest that co-leadership *can* work and provide preliminary evidence of antecedents of success and failure.

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Chapter 1: Introduction

In today's increasingly competitive and globalized economy, organizations need structures that facilitate flexibility and adaptation in order to survive (Lawler & Worley, 2006). This may involve modifying policies, procedures, or the organizational structure and hierarchy. Changes to organizational hierarchy and structure have considerable implications for the practice and study of leadership in organizations. In a recent review of the leadership research to date, Lord, Day, Zaccaro, Avolio, and Eagly (2017) call for scholars to rethink current theories, methods, and models of leadership because,

organizations are increasingly exploring many different ways to structure how people work and interact. The transformative changes in what constitutes structure will necessitate that theorists consider how to adapt our leadership models and methods to incorporate these changes into our analysis of leaders, followers, and leadership (p. 13).

In his discussion of definitions of leadership, Yukl (2006) notes, “most definitions of leadership reflect the assumption that it involves a process whereby intentional influence is exerted by one person over other people to guide, structure, and facilitate activities and relationships in a group or organization” (p. 3). The key takeaway from this statement is that most definitions revolve around behaviors exerted by *one* person. In response to the changing nature of work, however, there has been a surge in research on different forms of leadership in which multiple individuals enact leadership behaviors. In their review of leadership structures, Denis, Langle, and Sergi (2012) coined the term “leadership in the plural” to encompass the broad array of conceptualizations of multiple individuals enacting leadership behaviors. The authors argue for a shift in how researchers view leadership, highlighting leadership as a collective process between multiple leaders and followers, rather than a unitary concept of one leader influencing

followers. This paper focuses on a specific form of leadership in the plural, co-leadership, the use of which has gained popularity within organizations but is lagging in the necessary research to fully understand its merits and processes. The present study uses a sample of military co-leaders in order to better understand the processes involved in co-leadership by identifying and testing aspects of a theoretical model of antecedents and outcomes of co-leader relationship quality.

Chapter 2: Literature Review

What is co-leadership?

Before delving into past and current research on co-leadership specifically, it is important to differentiate co-leadership from the many other forms of “leadership in the plural.” Leadership can be thought of as a process in which “the roles and functions that make up leadership may be distributed throughout an organization” (Offermann & Scuderi, 2006, p. 72), both by singular individuals or by multiple individuals. This conceptualization of leadership as a process encompasses broad perspectives on what “leadership in the plural” can mean. The leadership literature uses a variety of terms to explain different situations in which multiple individuals perform leadership functions, and these terms and conceptualizations have implications for how different forms of leadership are studied and understood (Offermann & Scuderi, 2006). As mentioned, the term “leadership in the plural” was coined by Denis et al. (2012) in their review of the different streams of research and conceptualizations of having multiple individuals enact some form of leadership. Although plural forms of leadership have a degree of overlap in their conceptualizations and impact on organizations and teams, the body of research surrounding these conceptualizations differentiates them by explicating when these leadership structures are most advantageous, the antecedents to emergence or formation, the outcomes associated with each type of leadership structure, and the implications for leader development. For example, Offermann and Scuderi (2007) suggest “the dynamics of a team where leadership is shared by all are likely to be quite different from a team where only some people take on [leadership roles]” (p. 74), highlighting the importance

of gaining a clear understanding of the processes involved in different forms of plural leadership.

Offermann and Scuderi (2007) provide a framework in which plural forms of leadership are placed on a continuum from singular leadership to collective leadership on which the amount of “sharedness” spans from none (i.e., singular leadership) to total sharedness (i.e., collective leadership). The authors place co-leadership within the “shared” category of leadership processes but closer to singular leadership along the continuum, indicating that the amount of sharedness is limited to two members of a group. Similarly, Denis et al. (2012) delineate forms of plural leadership into more discrete categories based on commonalities in how leadership is conceptualized across fields of research. The categories they propose are *shared leadership, producing leadership through interactions, spreading leadership, and pooled leadership*.

The current organizational, group-focused literature focuses mostly on *shared leadership* emergence within teams. Research on shared leadership has referred to this emergent team process with many different terms, most popularly, “shared leadership” (Pearce & Conger, 2003). Other common terms include collective leadership (e.g., Sivasubramaniam, Murry, Avolio, & Jung, 2002) and much earlier, distributed leadership (e.g., Gibb, 1954). Although different researchers have used different terms, this body of work generally refers to “simultaneous, ongoing, mutual influence process within a team that is characterized by ‘serial emergence’ of official as well as unofficial leaders” (Pearce, 2004, p. 48). In other words, team members share the responsibility of enacting leadership behaviors in leading each other towards a goal (Offermann & Scuderi, 2007).

Most of the current research on shared leadership revolves around the antecedents and outcomes of shared leadership emergence and outcomes as a team process.

Similar to shared leadership, theories of *producing leadership through interactions* focus on leadership as an emergent process within groups and organizations (Denis et al., 2012). Although this form of leadership is similar to the shared leadership literature in that it views leadership as emerging informally within groups, it differs in that the focus is on the relationships between individuals and the emergence of leadership from communication and interactions. This stream of research falls into “relational” theories of leadership that view leadership as socially constructed (e.g., Uhl-Bien, 2006), which specify less of a structure and more of a process of leadership.

Another form of leadership in the plural, which deviates more from the shared and producing leadership theories, is *spreading leadership*, a conceptualization typically used in sociology, education, and public administration (Denis et al., 2012). This research focuses on how leadership is relayed from individual to individual, either within or between organizations, over time (Denis et al., 2012). Research on spreading leadership typically investigates how organizations collaborate with each other (e.g. Crosby & Bryson, 2010; Denis et al., 2012) or how relaying leadership between individuals can influence change within or between organizations over time (e.g., Buchanan, Addicott, Fitzgerald, Ferlie, & Baeza, 2007; Denis et al., 2012).

In their last categorization, Denis et al. (2012) describe a structure of *pooled leadership* at the top of a group or organization. Pooled leadership refers to instances in which two or more leaders share leadership of a group or organization and is most closely related to the co-leadership context that will be investigated in the current study. Within

the pooled leadership category, co-leadership is also often referred to as dual leadership or dyadic leadership. The current study will use the term co-leadership because it more clearly connotes two leaders coordinating and working interdependently as leaders of the group. Past definitions of dual or co-leadership notes leader dyads must share influence over the group (e.g., Hunter, Cushenberry, & Jayne, 2017); the phrases dual leadership or dyadic leadership, alternately, may imply simply the existence of two leaders who may or may not “share [the] role space,” a stipulation suggested in previous research on co-leadership (e.g., co-principals; Dass, 1995; Stewart, 1991).

Pooled leadership differs from other conceptualizations of plural leadership because it does not imply that leadership emerges within a team or organization, but rather that leadership structures characterized by multiple leaders are purposefully and strategically imposed. This has implications for team and/or organizational outcomes because rather than having a team influence each other through leadership behaviors and interactions, two formal leaders mutually influence each other and downwardly influence the team they lead. Further, this has implications for the importance of how these two leaders interact with each other, and how their relationship and interactions impact their followers. Based on these differences in plural forms of leadership, the current study uses a definition of co-leadership adapted from Heenan and Bennis (1999), and more recently, Hunter et al. (2017): a collective approach in which two individuals share the leadership workload and coordinate efforts to engage subordinates in accomplishing goals.

Although each stream of research within these leadership frameworks identifies differences between conceptualizations, it is likely that there are also some

commonalities across structures of plural leadership. To start, all streams of this research reject the notion that leadership is a unitary construct and argue that multiple individuals can and do enact leadership of a group or organization. Additionally, the research attempts to understand how leaders work together to accomplish group and organizational goals. Unfortunately, much of the research surrounding these topics is not directly comparable. Denis et al. (2012) note that the organizational literature on shared leadership tends to use more quantitative, survey-based and experimental methods while the other concentrations opt for qualitative case studies or ethnographies. This makes it difficult to generalize findings across disciplines and determine clear meta-analytic patterns about how these structures function similarly and differently within organizations. In order to begin to understand a broader concept of leadership in the plural, it is important to be able to understand factors that impact leadership structures and how these different structures impact groups and organizations, an undertaking that involves more thorough hypothesis testing to start building more explicit models and synthesizing theories related to different leadership structures.

In a discussion of future leadership demands and trends, the Hay Group (2011) forecasts that dual leadership or other forms of shared leadership will become increasingly more popular over the next 30 years due to the changing nature of work, creating a sense of urgency for leadership research to focus on understanding the complexities involved in plural forms of leadership. In order to accomplish this, Denis et al. (2012) advocate for more variety in research methods, and specifically, suggest more quantitative research in the areas of spreading leadership, producing leadership, and pooling leadership. The current study aimed to do just this, gain a deeper understanding

of pooled leadership, specifically, co-leader dyads, by proposing and empirically testing aspects of a model of antecedents and outcomes related to the quality of relationship between co-leaders. This research contributes significantly to the broader understanding of plural leadership as well as sheds light onto a leadership structure that is growing in popularity and use across organizations but is not yet well understood. In the following sections, this paper outlines the current state of research on co-leadership, address gaps in our understanding of this leadership structure, and proposes and tests components of a theoretical model of the antecedents and outcomes of co-leader relationship quality.

Current body of knowledge on co-leadership

Co-leadership structures are not new to organizations. For many years various types of organizations have experimented with co-leadership structures (e.g., co-CEOs). However, despite the use of co-leadership for many years, most of the current research does not provide a comprehensive view of when and why co-leadership is successful or unsuccessful. Many studies focus either on historical examples of organizations that have used a co-leadership structure, or theorize the potential benefits of co-leadership, but none explicitly provide a testable model of how and when co-leadership works. The sections below briefly review examples of industries that have embraced co-leadership, the current views on the benefits of this structure, and the current findings across a variety of fields.

Examples of co-leadership in practice

The most prominent example of co-leadership, and the focus of many studies and media attention, is co-CEO teams. A growing number of companies throughout the 20th and 21st century have had or currently have implemented a co-CEO structure, both

successfully and unsuccessfully, such as Oracle, Chipotle, Whole Foods, Deutsche Bank, Martha Stewart Living Omnimedia (Feloni, 2014), Research in Motion, Twitter, California Pizza Kitchen, Motorola, Unilever, Kraft (Arnone & Stumpf, 2010), Bed, Bath, & Beyond, Citigroup, and IMAX (Krause, Priem, & Love, 2015).

Despite the imbalance in media attention, co-leadership is not exclusive to top management in large organizations, but is also found in smaller organizations (Alvarez, Svejenova, & Vives, 2007). A good example of smaller organizations that are beginning to use co-leadership is schools. There has been a surge in qualitative case studies, mainly in the education literature, on how co-leadership is used in schools, specifically with co-principals. This change stems from a decrease in desirability for the position that comes with high expectations and stress, but relatively low compensation (Eckman & Kelber, 2010). One of the ways to combat the stress and demands of this job is to have two principals, each focusing on different aspects of leading the school, reducing the load for each individual. Eckman and Kelber (2010) cite that this new model is being widely implemented across the world (e.g., in Australia, China, New Zealand, the United Kingdom, and the United States) but little is known about its effectiveness or sustainability.

Co-leadership is also gaining popularity within healthcare settings. For example, there has been a stream of research on co-leadership in mental healthcare and group counseling settings (e.g., Atieno Okech, 2008). Often group counseling is conducted by two co-leaders and thus, much of the research is based in this setting. This field has primarily relied on qualitative methods to understand how co-leaders of counseling groups interact and work together to achieve positive outcomes for the group.

Additionally, medicine in general has been moving more towards a team-based framework in which pairs of physicians or physicians and nurses often work together as co-leaders of surgical teams or other medical teams (e.g., Klinga, Hasson, Hasson, & Sachs, 2016; Steinert, Goebel, & Rieger, 2006; Thude, Thomsen, Stenager, & Hollnagel, 2017, Ponte, 2004). In addition to these more traditional settings, co-leadership has been in practice for many years in sports organizations and coaching at many levels. It is typical for a sports team to have a coach and an assistant coach or other coach that is more specialized. This structure is also extremely common in art institutions (e.g., theatres, opera houses, museums) such that one leader can focus on the creative mission of the organization while the other focuses on the business management side (De Voogt, 2006).

Lastly, co-leadership has been an essential leadership structure in the military for centuries. The use of the commissioned officer-noncommissioned officer (i.e., Officer-NCO) partnership can be traced as far back as the Ancient Roman Empire (c. mid-2nd century; Goldsworthy, 2003). Although the ancient Roman military did not use the same titles as modern-day militaries, there existed an officer-NCO equivalent partnership, sharing similar roles and responsibilities as their modern-day officer and NCO counterparts; many of the world's present military structures are rooted in this millennia-old form of organizing. Co-leadership between an officer and an NCO in the U.S., specifically, started at the inception of the U.S. Army during the American Revolution (c. 1775; Army Sergeants Major Academy, 1991). Throughout U.S. military history, NCOs have served as co-leader counterparts to officers, as they led small units and gained increasing responsibilities for Soldier training and development (Elder, 2015). This

partnership is crucial to the success of the Army, as successful co-leadership is necessary at all levels of the organization from Platoon Leader-Platoon Sergeant pairs leading small units/platoons to the partnership between Four-Star Generals and Command Sergeant Majors leading the Army in its entirety. Despite the historical and growing use of co-leadership in a variety of settings, comprehensive theories of effective co-leadership are scarce in the organizational literature.

Competing views on the use of co-leadership structures

Many authors argue for the benefit of co-leadership (e.g., Hunter et al., 2017), while others suggest it cannot be successful (e.g., Hackman, 2002; Mintzberg, 1989). Although the need for research on co-leadership has more recently gained attention, theories proposing the benefits of co-leadership are not new. Much of the research on distributing leadership across individuals suggests this strategy is beneficial when one individual cannot effectively satisfy the leadership needs of the group (Burke, et al. 2003; Offermann & Scuderi, 2006). This view was presented in one of the earliest theories on co-leadership, the Bales-Parsons Dual-Leadership Theory (Etzioni, 1965; Bales, 1953; Bales & Slater, 1955), which posited that groups need both instrumental (i.e., task-oriented) and expressive (i.e., relation-oriented) leadership in order to be effective. Etzioni (1965) argued that individuals are either predisposed to be instrumental or expressive, and rarely can leaders provide both styles of leadership simultaneously, resulting in the need for two leaders. Despite the lack of substantial, current, empirical research on this theory, the same basic principals have gained a resurgence in organizations that see the benefit of dividing major responsibilities between two leaders.

In a more recent article in the Sloan Management Review, Alvarez et al. (2007) argue the same point as Etzioni and suggest that co-leaders with different leadership styles and competencies, can contribute different knowledge and skills simultaneously to an organization, which can be difficult for a single leader. Additionally, several researchers suggest that this structure can be beneficial for organizations that are more complex (e.g., O'Toole, Galbraith, and Lawler, 2002; Pearce and Conger, 2003) or require both high-level innovation and day-to-day process management (e.g., Hunter et al., 2017). In addition to contributing more leadership competencies and resources, co-leadership can benefit leaders and organizations through succession planning, decision-making quality, idea generation, and the sharing of burdensome responsibilities (Heenan & Bennis, 1999).

Hunter et al. (2017) used a conservation of resources approach to support this argument that the current demands of organizations are too onerous for a single leader. More specifically, they suggest that the increasing demand for innovation in organizations creates too much of a cognitive burden on one leader. This cognitive burden stems from the two main leadership functions in supporting innovation, which are exploration and exploitation. These terms refer to the pursuit of new ideas and adaptability, as well as maintenance and improvement of current processes and products, respectively. Together, these functions create internal competition for cognitive and emotional resources and one individual is unable to dedicate a sufficient amount of these resources for success in each function. Thus, having co-leaders, one to focus on exploration and another to focus on exploitation is beneficial to both the leaders and the organization. Further, the authors suggest that when leaders have complementary skills

in these domains, organizations can ultimately perform better. They do, however, note potential issues within this relationship, a topic that will be explored in more detail in this study.

Extending the propositions by Hunter et al. (2017), Allen, Jayne, and Hunter (2019) explored the impact of different leadership structures on creativity in a laboratory experiment with student teams. In their experiment, leadership structure was manipulated such that half of the student teams were led by co-leaders, while the other half was led by a singular leader. Their findings demonstrated that a co-leadership structure was related to generation of higher quality and more creative team ideas in a brainstorming task as compared to teams lead by a singular leader. However, singular leader-led teams outperformed teams with co-leaders when it came to quality of plans for implementation of the ideas generated during brainstorming. This suggests that while co-leadership had clear benefits during the creative brainstorming component of the laboratory task, the structure of co-leadership alone is not sufficient for success on *all* tasks and research should further delve into factors impacting the success of various leadership structures.

Alternately, there are other streams of research that are in strong opposition to the push for co-leadership in organizations. Arguments against co-leadership also date back to early organizational research. Most notably, the unity-of-command principle (Barnard, 1968; Gulick & Urwick, 1937; Fayol, 1916; Simon, 1997) states that organizations are most effective when employees receive order from only one superior. Organizational theorist such as Fayol (1916; 1949) argued strongly in favor of this principle; he specifically argued “in no case is there adaptation of the social organism to dual

command” (cited in Shafritz, Ott, & Jang, 2011, p. 55) and even went as far as comparing dual leadership to a monster, arguing that “a body with two heads is in the social as in the animal sphere a monster, and has difficulty in surviving” (Fayol, 1949, p. 25; cited in Krause et al., 2015, p. 2099). Some more recent theorists have continued to adhere to this principle. For example, Mintzberg (1989) and Hackman (2002) argue that co-leadership can never be successful because of the inability for co-leaders (specifically, co-CEOs) to coordinate, manage conflict, or jointly make decisions.

As the work environment changes, leadership research and practice remains in this tug-of-war between traditional views of singular leadership and newer innovative forms of leading. Even amongst practice-oriented popular press outlets there are competing views. For example, a popular press article in *Fortune*, takes a bold stance that co-CEOships *cannot* work with an article titled “With co-CEOs, companies flirt with disaster” (Zillman, 2014). The author cites various examples of failed co-CEO structures, as well as quotes organizational researchers that argue that co-CEO structures cause conflict, poor team performance, and creates hostility. A key omission in this article and many of the statements on the failures of co-leading is that this research does not delve more deeply into instances in which co-leadership in top management *does* work, but rather simply focuses on historical failures in large organizations.

More recently, *Forbes* took a competing perspective, suggesting that co-CEOs can work. O’Donnell (2017) interviewed a co-CEO pair, founders of the Rightpoint organization, and summarizes advice they have for successful co-CEOs. They suggest that with a clear division of responsibilities, productive disagreement, equal commitment, and treating your counterpart as a married couple would, co-CEOs can have a successful

working relationship. Although these articles cite a handful of single case studies and anecdotal evidence, they represent broader competing views in the literature that stem from a range of findings on the success of co-leadership structures.

Despite continued argument for or against the unity-of-command principal, organizational theorists have generally accepted that the changing nature of work does require updated theory to match the increasingly dynamic and complex environment in which organizations function (e.g., Huber, 2011), and old theories of leading may not hold in today's organizations (Lord et al., 2017). As in most organizational research, there are situational factors and boundary conditions that provide a richer understanding of organizational processes and arguments for or against co-leadership as a structure are not as useful as explorations into *when* and *how* co-leaders are successful.

Existing empirical research on co-leadership

Although researchers are quick to argue theoretically that co-leadership does or does not work, there is a dearth of definitive evidence to support these claims. Most of the current empirical research on actual co-leaders does not take a definitive stance on whether this structure is better or worse than singular leadership structure, but rather provides examples of both success and failure in co-leadership in attempts to describe the context surrounding successes or failures. The most common streams of research on co-leadership are explorations of co-CEOs, co-principals, and co-leading in healthcare settings; a summary of findings from these fields are provided below.

Research on co-CEOs. Research on co-CEOs occupies much of the organizational research on co-leadership and has mainly been qualitative in nature, although a small amount of quantitative research has been done using publicly available

archival organizational data. Arnone and Stumpf (2010) interviewed 19 “co-heads” to understand the organization’s motives behind having two executives leading at the top, as well as the benefits and drawbacks of this leadership structure. Findings revealed four main organizational motives for adopting this structure: (a) having leaders with complementary skills, (b) transitioning employees in and out of leadership positions, (c) retaining top performers that may seek external leadership opportunities, and (d) using this structure in times of organizational change such as expansion and/or mergers and acquisitions.

Regarding common pitfalls in co-leadership, interview participants indicated that co-leaders may see each other as rivals due to high personal drive, leading to a variety of issues with a highly competitive relationship. Additionally, subordinates may have divided loyalties or confusion as to which leader they should report. The authors found that overcoming these barriers to success requires high quality communication, clear reporting structures for subordinates, clearly divided responsibilities, open-mindedness, self-awareness, perspective taking, and generally establishing a positive working relationship. Positive outcomes of successful co-leadership included personal growth and development as leaders, higher quality decision-making, and decreased stress at the individual and dyad level, as well as increased profits, sales, and business growth at the organizational level. In a similar vein, Alvarez et al. (2007) also qualitatively explored success and failure in co-CEOs. The authors identified similar requirements to success such as forming a positive working relationship and effective communication, adding that effective conflict management, shared vision and goals, and shared decision-making criteria are also key elements to success.

Alternately, Arena et al. (2011) offer a quantitative perspective on co-leading. The authors used publicly available archival data and found that co-CEOs can be beneficial to organizational value and performance, but they did not explicitly explore antecedents to co-CEO success. In their general discussion, they note similar possible barriers to success such as coordination problems, interpersonal conflicts, and competition for power. In addition to Arena et al.'s (2011) exploration, Krause et al. (2015) offer an alternate view of how co-CEOs impact organizational outcomes. Also using publicly available data from 71 organizations with co-CEOs, the authors found that a moderate power gap between co-CEOs (i.e., one CEO has more structural power over the other) was more strongly related to firm performance than both low- and high-power gaps. Although Krause et al. (2015) did not compare organizations with singular versus co-CEOs, they offer interesting insights into the complexities of the co-CEO structure, suggesting that power differentials between the co-leaders plays a role in the success. One limitation of this study is that it uses a proxy for power gap calculated as a composite of publicly available data such as CEO salary and tenure with the organization, rather than data revealing the leaders' or followers' perceptions of formal or informal power structures.

Research on co-principals. Another common population for co-leadership studies is educational administrators. In an exploration of co-leadership in education administration, Eckman (2006) surveyed 48 co-principals on the strengths and weaknesses of co-leading. In open-ended responses, participants indicated strengths of co-leading were shared decision-making, problem solving, workload sharing, and having someone to “bounce ideas off of,” all of which they attributed their decreased stress

levels. However, participants did note many weaknesses of the system. For example, participants mentioned problems with communicating, defining responsibilities, presenting a united front, having different values, sharing power, and generally working with others that may have a large “ego.” The author notes the lack of information on this leadership model and expresses the need for additional research on this working relationship.

Eckman and Kelber (2010) extend the earlier research on co-principals by comparing a group of female singular principals and a group of female co-principals to investigate important job-related outcomes between the two leadership structures. Findings indicated that co-principals had higher job satisfaction and lower role conflict in comparison to single principals. Although these outcomes are not explicitly linked to school success in this study, the broader organizational literature acknowledges the importance of job satisfaction and decreased role conflict in performance and well-being at work. Similar to the earlier study on co-principals, the participants acknowledged the potential downsides of co-leadership such as difficulty compromising and sharing power; however, the women also felt the upsides of co-leadership outweighed these potential issues. These findings indicate that co-leaders who can develop good working relationships through successful division of responsibilities and shared decision-making are more likely to be successful and reap the benefits of co-leading. Further, some participants revealed that co-leading can benefit both members of the dyad through mentorship and encouragement as they both develop as leaders.

Research in healthcare settings. Many healthcare teams are adopting the co-leadership structure (e.g., physician-nurse dyads, physician-physician dyads), but one

branch of healthcare that has most strongly embraced co-leadership is counseling and mental health teams. Various healthcare researchers identify co-leadership as the predominant form of group leadership in group counseling (Atieno Okech, 2008; Kline, 2003; Yalom & Leszcz, 2005), and as a result, there is a body of research devoted specifically to co-leadership in therapy and counseling settings. For example, Dugo and Beck (1997) used a case study approach that followed a therapy co-leadership team to identify phases of co-leader development and how this impacted group outcomes. They found that “development of a mature relationship between co-therapists [facilitated] the group process and provide[d] more effective treatment to clients, with less risk to all involved” (p. 294) and that “malformed co-therapy teams hamper[ed] group development” (p. 298).

Further, Atieno Okech and Kline (2005) also explored co-leading in counseling by following a group of counselors that co-led group therapy sessions over a 16-week period. Findings from this qualitative exploration not only revealed that effective co-leading of therapy groups was associated with positive group outcomes, but participant responses revealed similar patterns in predicting co-leadership success as in other organizational settings. For example, the authors emphasize their findings on the importance of co-leader relationship quality, specifically, co-leader participants “believed that their effectiveness as co-leaders depended on the quality of their relationships” (Atieno Okech & Kline, 2005, p. 188). They suggest that this working relationship can impact group outcomes through modeling of positive relationships, providing consistent but diverse feedback to the group, providing mutual support, sharing of specialized knowledge, and through improved assessments of the group’s dynamics. The authors

also detailed similar barriers to success as research on co-leadership in other settings such as, poor coordination, competition, disagreements on strategy, and lack of support and encouragement for each other. Further, positive and constructive co-leader interactions such as open communication and honesty contributed to development of an effective working relationship.

The richness of the longitudinal qualitative data from studies on co-counseling provide detailed insight into co-leadership interactions and attitudes towards the relationship, but are limited in the generalizable, empirical support they can provide, as much of the research in this context is limited to case study explorations. More broadly, research on co-leadership is not limited to CEOs, education, and healthcare settings. Although it has not gained as much traction in other fields, there is some research on co-leadership in other settings. For example, research on co-leading police teams has shown that co-leaders joint success was attributable to their relationship and commitment to each other in addition to their team and mission (Newton, 2015).

Gap in the literature: What do we know and what don't we know about co-leadership? Taken together, the current body of research on co-leadership in various settings provides a foundation for more quantitative exploration and formal hypothesis testing. Across the studies summarized above, researchers have identified examples in which co-leadership does and does not work, common barriers to success (e.g., interpersonal barriers such as conflict, coordination, decision-making, dividing responsibilities, competition), and solutions (e.g., high quality communication, creating clear roles and responsibilities, supporting each other, keeping an open-mind, perspective taking), as well as various group and organizational outcomes (e.g., profits, growth,

climate, group success) and individual outcomes (e.g., decreased personal stress and growth as leaders). This body of research suggests co-leadership can work in some situations and not others, thus future research should be focused more on *when* it works and *how* to make it work when this structure is theoretically more optimal for the organization.

There are many strengths of the research summarized above, such as the richness of the longitudinal, qualitative case studies as well as the use of objective organizational outcome data. However, there are also limitations in relying on these findings alone. Small samples and case studies make up most of our understanding of co-leadership and the larger samples and quantitative analyses are limited to publicly available archival data, rather than data collected directly from co-leaders and their subordinates. Research would benefit from finding a methodological middle ground by collecting data directly from co-leaders and their subordinates and quantitatively testing formal hypotheses regarding co-leadership. The current study attempts to do just this and to fill the gaps in our knowledge of co-leadership.

Current study

Drawing from the existing research on co-leadership, as well as broader theory on social interactions and relationships, team effectiveness, and leadership, the current study presents a comprehensive theoretical model of the antecedents and outcomes of co-leadership relationship quality and co-leader effectiveness. Additionally, parts of this model were empirically tested using a sample of co-leaders in the U.S. Army. Like much of the current research on this topic, this study is an extension of a previous

qualitative exploration of co-leadership in the Army context, which will briefly be described in a subsequent section.

Co-Leadership in the Army context. Although co-leadership is gaining popularity in many types of organizations and industries, a military setting is a good opportunity to investigate some of the antecedents and outcomes of successful co-leaders because of the nature of the organizational structure. The Army is built on a hierarchy of co-leadership; at each level, starting with the platoon, there is a commissioned officer (i.e., officer) and a non-commissioned officer (i.e., NCO) counterpart¹.

The success of the Army relies on effective platoons that act as building blocks for successful companies, which in turn build up effective battalions, brigades and so forth, each level led by two leaders (see Appendix A for full organizational structure). Army leaders provide a unique opportunity for this research because the Army can offer access to a larger number of co-leaders in a relatively controlled setting, allowing for stronger comparisons across dyads and teams. The following sections will provide more insight into the context in which co-leadership functions in the Army before putting forth a conceptual model and hypotheses of potential antecedents and outcomes of successful co-leadership.

Although the Army has been implementing this co-leadership structure for decades, it is far from a perfect system. Similar to other co-leader contexts, Army co-leaders face similar barriers to success as co-leaders in other settings, as well as some

¹ The terms commissioned officer (i.e., officer) and non-commissioned officer (i.e., NCO) do not refer to a specific rank, but rather commissioning source; when referring to officers and NCOs in general, regardless of rank within the officer/NCO categories, these terms will be used. Alternately, when referring to Soldiers in specific ranks and leadership positions, they will be referred to by the position title (e.g., platoon leaders and platoon sergeants). Any title including the term “sergeant” refers to an NCO (e.g., Staff Sergeant, Sergeant First Class, Master Sergeant) and all other titles refer to officers (e.g., Lieutenant, Captain, Major).

Army-specific issues. Army specific issues may stem from differences in age, experience, career stage, and the hierarchical structure of the organization that is associated with these differences. Specifically, the process in which officers and NCOs become leaders differs greatly based on the path in which they take to enter the Army. Officers are commissioned upon graduating with a bachelor's degree in concert with a military training component (e.g., West Point, ROTC programs), which allows them to enter leadership positions almost immediately upon graduation. Alternately, NCOs are not commissioned, and therefore start as junior enlisted Soldiers, a path which requires more time and experience to enter leadership positions.

On average, commissioned officers become Platoon Leaders (PLs; 1st and 2nd Lieutenants, the lowest ranking officers) within 6-18 months of college graduation, making them significantly younger and less experienced than their enlisted counterparts. NCOs become Platoon Sergeants (PSGs; typically, Staff Sergeants and Sergeants First Class, which are much higher ranks within the enlisted Soldiers; see Appendix A for list of ranks) after moving up the ranks of enlisted Soldiers. This allows NCOs to gain more experience in the Army, but also often makes them significantly older than their commissioned officer counterparts. In addition to age and experience differences, the hierarchical structure of the Army provides commissioned officers with higher rank and formal authority over their NCO counterpart, while maintaining the expectation that the pair co-lead their subordinate team.

It has been suggested that in co-leading situations it is common for one leader to have the ultimate authority, but that both leaders lead together or at different points in time or on different tasks (De Voogt, 2006; Krause et al., 2015). This hierarchical

structure can be both beneficial and detrimental to team and organizational effectiveness. Some research posits that the hierarchical differences can improve effectiveness through increased structure and guidance facilitated by a leader at the top of the hierarchy that benefits coordination processes (e.g., Halevy, Chou, & Galinsky, 2011; Keltner, van Kleef, Chen, & Kraus, 2008; Van der Heijden, Potters, & Sefton, 2009). Other scholars suggest that hierarchy is inherently detrimental because it leads to conflict that can “distract members, impair conflict resolution process, and harm team performance” (Greer, De Jong, Schouten, & Dannals, 2018, p. 12; Bendersky & Hays, 2012; Chun & Choi, 2014; Greer & Van Kleef, 2010).

Greer et al., (2018) conducted a recent meta-analysis to determine whether the “functionalist perspective” (i.e., hierarchy has a strong functional purpose in team effectiveness) or the “conflict perspective” (i.e., hierarchy causes conflict states hindering effectiveness) demonstrated more support. Findings suggested that the conflict-enabling perspective had more support, but the authors do suggest that there may be contextual contingencies at play. For example, the authors found support for the functionalist perspective when the team task was highly ambiguous or there was high temporal instability (Greer et al., 2018). In many contexts, especially the Army, the team context is highly ambiguous and therefore, the benefits of hierarchy may outweigh its costs. Additionally, De Voogt (2006) suggests that conflict can arise when two leaders disagree but have equal authority and rank, and that one leader should always have ultimate formal authority, such as is the case in the Army. However, this can also lead to interpersonal issues within the leadership team.

In these cases when a hierarchical structure is necessary, it is important to understand how this can impact team processes in order to attempt to alleviate some of the negative impact it can cause. With co-leaders in the Army context, or other co-leading situations marked by differential rank and status, varying hierarchical status, in congruence with age and experience differences, may have serious negative impacts on the leaders' ability to work well together. The next section will describe some of the possible issues in pairing leaders in this hierarchical structure that differ in age, experience, rank, and status and how this may impact co-leader processes.

Common issues facing co-leadership. Developing a successful co-leadership team may not come as easy to some pairs as to others. Dugo and Beck (1997) describe how during the process of negotiating roles as co-leaders, the pair may face difficulties such as “competitive feelings, irritations, anxiety, differences in personal and conceptual priorities, and/or the temptation to resolve conflict by the use of power or manipulation,” but that it is imperative to create norms together that allow for a collaborative effort and collective identity as co-leaders to be established (p. 297).

One of the main issues with a hierarchical structure is the contention between formal hierarchical status and social status within the team. Although one leader, such as the PL, has ultimate hierarchical status, the other (i.e., the PSG) may hold a higher social standing within the team. The PSG is a non-commissioned officer just like the junior enlisted subordinates, which provides them an immediate connection of a more shared Army experience. The PSG also typically has more knowledge and experience of how the Army functions day-to-day and has more face-to-face time with the platoon members, which may ultimately grant him or her the higher social standing. In the struggle to share

power and influence on platoon members, the two leaders may be predisposed to status conflicts over social standing in the team. This type of interpersonal conflict is rooted in disagreements regarding dominance in social relations (Bendersky & Hays, 2012; Gould, 2003), which may create increased tension between the co-leaders in this context.

Because social status within a team is considered to be conferred by others, it is seen as mutable (i.e., opportunity for upward mobility), and thus, it can create more competition and tension (Hays & Bendersky, 2015; Magee & Galinsky, 2008) between the two leaders in their struggle to gain or maintain their status as leaders.

In addition to issues of social status and influence within the hierarchy, the co-leaders are also predisposed to interpersonal conflicts due to the interaction between hierarchical rank/status, and age and experience differences. The issues facing PL-PSG pairs in regard to age, experience, and hierarchy structure closely mirrors emerging trends in organizations that have younger, less experienced employees managing older, more experienced employees. Much of the research in this area suggests that “these age-related demographic changes are bringing about a role reversal in the workplace that violates established age norms, creating status incongruence in the supervisor-subordinate dyad” (Collins, Hair, & Rocco, 2009, p. 21).

This trend has emerged based on younger individuals being promoted as a result of higher education, information technology skills, and expertise in strategic planning (Collins et al., 2009; Sopranos, 1999). This is occurring in parallel in the Army because PLs often have higher levels of education and are expected to have more knowledge in strategic planning, while the PSGs have more experience in the Army and more knowledge of day-to-day functioning and Soldier development. This differential in

knowledge and skillsets is designed to be complementary and beneficial to team success; however, age and experience disparities challenge traditional age and status societal norms, possibly attenuating the positive outcomes of having co-leaders with complementary knowledge and skillsets. Collins et al. (2009) note that “subordinates often associate supervisor attributes such as age to wisdom [and] tenure to valuable experience” (p. 24), norms that may be violated when the supervisor is younger and has less work experience.

Some research suggests that these differences, often based on surface-level demographics differences (e.g., age), are incompatible with workplace and societal norms and can negatively impact the relationship between supervisors and subordinates (Collins et al., 2009; Tsui, Xin, Egan, 1996). For example, research suggests that older workers may be less supportive of younger supervisors that are seen as too young to have valuable experience and knowledge. Alternately, the younger supervisors may also perceive less support “[believing] they receive less loyalty and fewer contributions from older workers” (Collins et al., 2009, p. 23; Tsui et al., 1996). Some of the main problems associated with this dyadic relationship are that older workers are reluctant to take instructions from younger workers and alternately, younger workers are hesitant to instruct older workers. This can lead to coordination and conflict problems that ultimately hinder their leader-follower working relationship (Collins et al., 2009). Subsequently resulting in negative outcomes such decreased job satisfaction, turnover, and performance (Gerstner & Day, 1997). Although the Army context is slightly different from these studies on societal norms for leaders and followers, as PLs and PSGs are supposed to *co-lead*, these findings provide information on how these individual

differences may create tension between individuals when there is some sort of hierarchical and age difference.

In addition to challenges rooted in rank/hierarchy, social status, age, and experience, co-leaders may face other common barriers to creating a successful working relationship that often plague organizational teams. Conflict is very common between coworkers and team members as individuals often have discrepant ideas or incompatible wishes and desires (Jehn & Mannix, 2001; Somech, Desivilya, and Lidogoster, 2008). Additionally, coworkers often have different views on how work should be accomplished, to whom certain responsibilities belong, which goals to prioritize, among many other possible scenarios in which individuals may not work well together. This can be particularly damaging to individuals expected to cooperate with each other in order to successfully co-lead others.

Despite common issues facing team members and strong contexts predisposing co-leaders to interpersonal issues, some co-leaders are able to have effective co-leader relationships and in turn, are more effective as leaders in comparison to pairs unable to build effective relationships, which begs the question: *what are the main factors impacting relationship quality in co-leader dyads?* This question was posed in a qualitative exploration of PL-PSG co-leader teams, findings from which serve as the foundation for the current study and are briefly summarized in the next section.

Initial exploratory research on Army co-leadership. The current study builds upon previous explorations into the relationship between PLs and PSGs, the smallest unit that utilizes co-leadership in the Army. In an investigation of leader identity, interviews were conducted with both officers and NCOs. A common, unprompted theme that

emerged was that the relationship between PLs and PSGs was highly influential on platoon effectiveness and leader development.

Based on the robustness of these unprompted findings in the interviews, the researchers conducted a subsequent qualitative exploration (technical report in progress) more specifically aimed at understanding this dyadic relationship. This study implemented a grounded theory approach in order to help develop theory on co-leadership where it does not yet exist. Fifteen semi-structured focus groups were conducted with Active Duty, current and former PLs ($n = 18$) and PSGs ($n = 21$) about the impacts and outcomes of successful and unsuccessful PL-PSG working relationships. Interviewers asked questions such as, “please walk us through an example of an effective/ineffective relationship between a PL and a PSG.” Three independent coders agreed on the emergence of seven major themes relating to relationship quality. These themes include: 1) *having a shared understanding of roles*, 2) *having shared goals*, 3) *participative decision-making*, 4) *communication*, 5) *conflict management*, 6) *willingness to learn from each other*, and 7) *supporting and empowering each other*. Participants also noted a poor-quality relationship between PL and PSG can have negative effects on the platoon. Not only are these findings in line with much of the qualitative research reviewed in the previous sections, but the seven themes identified as relating to relationship quality are also characteristics of effective teams in general (e.g., effective team processes; Marks, Mathieu, & Zaccaro, 2001; Salas, Sims, & Burke, 2005). Thus, these characteristics can be logically applied to co-leaders, a team of two. Given that the findings from this qualitative exploration are in line with much of the co-leadership and

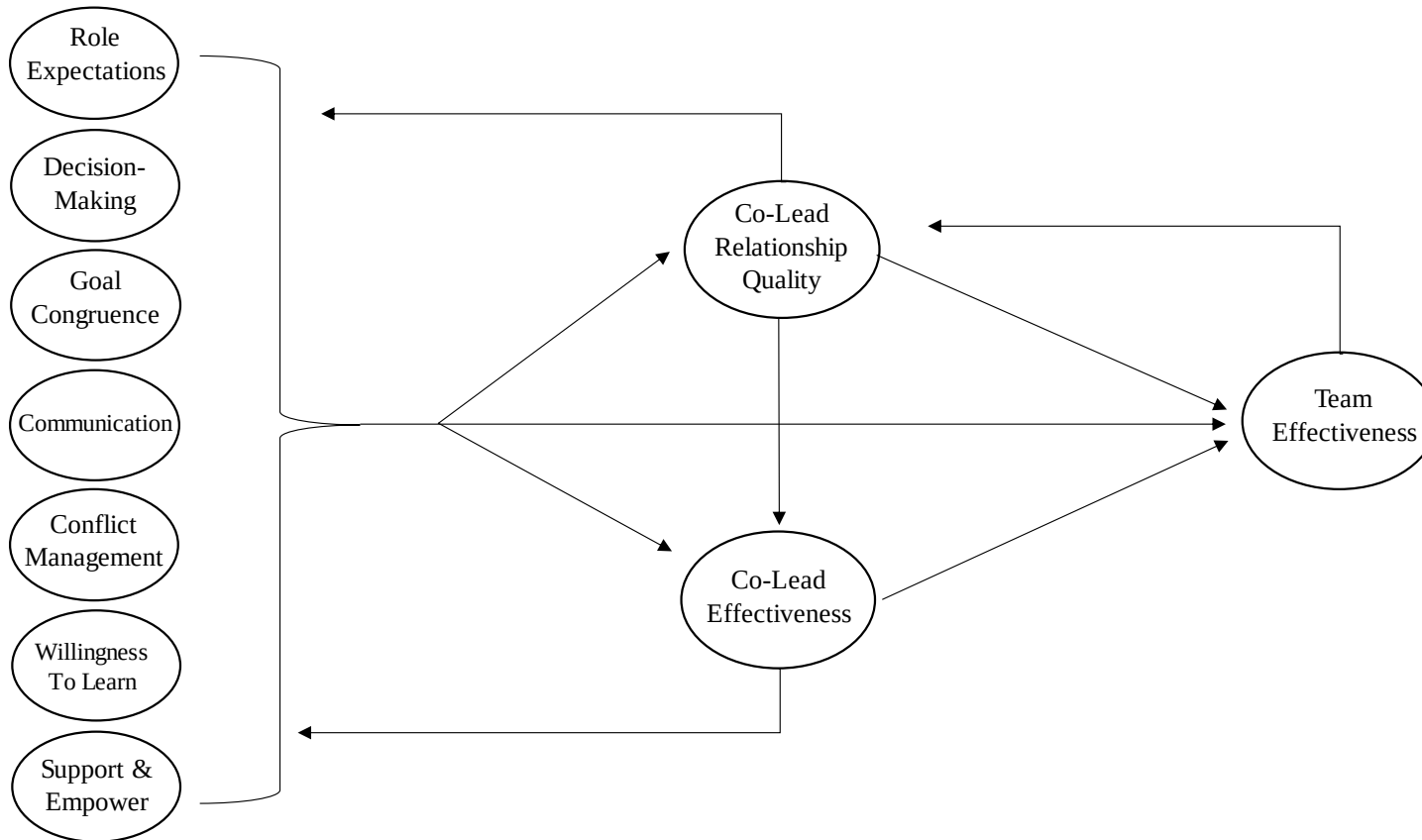
teams research, these themes provide a solid foundation for developing and testing the theoretical model described in the following sections.

Questions addressed in the current study. Based on the gaps that exist in our understanding of co-leadership and as an extension of the original Army qualitative co-leadership explorations, several theoretical questions are addressed in the current study.

- 1) Are the themes identified in the original qualitative exploration (i.e., having a shared understanding of roles, having shared goals, decision-making, communication, conflict management, willingness to learn from each other, and supporting and empowering each other) antecedents to co-leader relationship quality?*
- 2) Do both leaders view these factors relating to their relationship the same way (i.e., is the relative importance of each antecedent in predicting relationship quality the same across PLs and PSGs)?*
- 3) Does relationship quality predict co-leader effectiveness?*
- 4) Does relationship quality and co-leader effectiveness impact team effectiveness?*

The following sections highlight relevant theory to address these research questions and further support the proposed model of antecedents and outcomes of co-leader relationship quality (see Figure 1a). Although the full conceptual model and theoretical development is presented below, the current study is limited in its sample size and therefore, the full model cannot be tested simultaneously. Several propositions are put forth in the following sections detailing how the model functions, but the specific hypotheses tested represent a subset of these propositions.

Figure 1a
Theoretical Model of Antecedents and Outcomes of Co-Leader Relationship Quality



Note. The arrows from co-leader relationship quality back to the antecedent interactions and from team effectiveness back to co-leader relationship quality indicate cyclical processes.

Theoretical Development.

1) Are the themes identified in the original qualitative exploration antecedents to co-leader relationship quality? The first research question pertains to the left side of the proposed theoretical model, specifically looking at whether the antecedents derived from the original qualitative exploration predict co-leader relationship quality. This assertion can be supported with broad theories, such as interdependence theory (Kelley, 1979; Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) and social exchange theory (Blau, 1964), as well as more specifically by looking at the role that each antecedent might play in developing a successful working relationship.

To start with broad theory, these antecedents collectively represent a set of workplace interactions the two leaders engage in while working together. From the start of their time together, the two leaders need to ensure there is a shared understanding of roles and responsibilities, create congruent goals, make decisions, communicate well with each other, manage conflict between themselves, learn from each other, and support and empower each other throughout the process. These interactions can range from positive and constructive to negative and destructive to their relationship and hinder their ability to work well together; overall, the quality of these interactions drives the development of a relationship, either good or bad.

Interdependence theory (Kelley, 1979; Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) is central to understanding this idea and demonstrates fundamentally how relationships are formed and unfold over time. The theory suggests that characteristics of relationships (such as quality and depth) build over a series of interactions between each individual and that the content, quality, and depth of these interactions is the essence of

relationship quality (Rusbult & Buunk, 1993). Therefore, the dyad's quality of interaction on these work-related factors impacts the quality of relationship they build together. This theory has been supported over decades of research in social psychology and is considered the foundation for understanding the development of interpersonal relationships and is the core of all social exchange theories (Rusbult & Buunk, 1993).

Core tenets of social exchange theory (Blau, 1964), an extension of interdependence theory, also support the argument that series of exchanges between two individuals alter their interpersonal relationship. Further, individuals judge the quality of relationships with others based on the costs and benefits associated with the relationship (Thibaut & Kelley, 1959). Benefits can include material benefits, but more often refer to psychological benefits such as help and support, psychological gratification, as well as general positive attitudes and emotions. Costs also can include both material and psychological costs. Examples of psychological costs include increased relationship-related stress, emotional energy, or unreturned investments into the relationship (Eby, Durley, Evans, and Ragins, 2008; Levinger, 1983, 1999; Rusbult, 1983; Thibaut & Kelley, 1959). The link between these theories is that judgements regarding costs, benefits, and relationship quality stem from series of events and interactions that can be positive or negative over the course of the relationship.

These exchange theories have also been extended to a variety of more specific, organization-based social exchange literatures, such as leader-member exchange (previous labeled vertical-dyad linkage; Graen, 1976), team-member exchange (e.g., Seers, 1989), or leader-leader exchange (e.g., Chen & Lin, 2018). These subsequent applications of early social exchange theories highlight that workplace relationships, like

any other interpersonal relationship, are developed and negotiated over series of interactions (i.e., interacts) between each member of the dyad (Liden & Graen, 1980; Weick, 1979).

On a more specific level, each of the interactions in the proposed model is uniquely important to development of a high-quality relationship. Previous explorations into exchange relationships have identified several of these factors as key “interactional forms reflecting underlying exchange quality” (Fairhurst, 1993, p. 108). For example, Fairhurst (1993) found that higher LMX exchange relationships developed through mutual trust, role negotiation, internalization of common values and goals, mutual influence and support, less competitive conflict, fewer power games, and increased negotiating latitude; alternately, lower quality exchange relationships developed in the absence of these factors. Willems (2016) noted similar findings in his research on team-member exchange, which indicated that high quality communication, mutual support and helping behaviors, acknowledging each other’s efforts, and providing constructive feedback impacted the development of high-quality relationships among team members.

Research in other fields has also found similar factors to be important in predicting relationship quality between co-leaders, specifically. In the aforementioned exploration of co-leadership in counseling settings, Atieno Okech (2008) found that co-leader open communication and mutual support impacted development of positive attributes in co-leader relationships. Additionally, effective co-principals reported building good relationships through successfully dividing responsibilities, sharing decision-making power, and communication (Eckman & Kelber, 2010). Lastly, research on developing shared cognitions of how a team should function (i.e., a shared mental

model), has noted the importance of “heedful interrelating” (Druskat & Pescosolido, 2002, p. 288). Important components of this mindful and purposeful interrelating include good communication, social support, workload sharing, goal interdependence (e.g., Campion, Medsker, & Higgs, 1993), and caring (e.g., Cohen, 1994). These examples provide a brief overview and support that each of the antecedents in the proposed model play a factor in developing high quality relationships, but do not explicate *why* these factors are important. The following subsections provide a brief explanation of the underlying mechanisms through which each antecedent may be important in predicting co-leader relationship quality.

Shared understanding of roles. Findings from research on role clarity in the workplace and in teams, specifically, can be applied to co-leader teams and demonstrates the importance of having a shared understanding of roles. Role clarity (and its inverse, role ambiguity) refers to the extent to which an individual has clear information associated with a certain role (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). This involves understanding a) the scope of responsibilities within a role, b) the behaviors necessary to carry out those responsibilities, c) how these responsibilities are evaluated, and d) the consequences of not fulfilling those responsibilities (Beauchamp, Bray, Eys, & Carron, 2002; Eys & Carron, 2001; Kahn et al., 1964). Low role clarity can have negative consequences for occupants of the role, as well as those with whom the role occupant works interdependently (Beauchamp et al., 2002). When individuals lack clarity they are more likely to feel psychological anxiety as a result of ambiguity and uncertainty (Bedeian & Armenakis, 1981). Anxiety can lead to negative attitudes and feelings such as negative affect (e.g., Lagace, 1988; Terry, Nielsen, & Perchard, 1993),

stress (e.g., Ivancevich & Donnelly, 1974), lower satisfaction (e.g., Sawyer, 1992), and lower commitment to the role or organization (e.g., Griffin, Neal, & Parker, 2007).

In a setting in which roles are highly interdependent, such as in a team or as part of a co-leadership team, low role clarity has been shown to be related to low attraction to the team (Eys & Carron, 2001) and decreased perceptions of team support (Griffin et al., 2007); feelings of which can be damaging to interpersonal relationships among team members. Alternately, understanding one's own role, a partner or team member's role(s), and how the roles function together, allows members to work together in coordination, rather than having or perceiving overlap and redundancy in their roles and responsibilities, a key factor in team and co-leadership success. Many co-leadership scholars have noted the importance of clearly defining roles and responsibilities (e.g., Eckman, 2006). In a recent popular press article, *Forbes* interviewed co-CEOs who shared advice for successful co-leadership. The co-leaders emphasized the importance of "ensur[ing] clear division of responsibilities," and "stay[ing] in your lane" (O'Donnell, 2017). In other words, each individual needs to have a clear understanding of his or her role, their partner's role, and to make sure to stay within the boundaries of that well-defined role.

Shared goals. A logical extension of having clearly defined roles and responsibilities is having a shared understanding of the vision that these roles and responsibilities support. Having a shared vision and related goals is one of the most well-supported factors related to successful co-leadership, and most of the existing empirical research on co-leadership and high-quality workplace exchange relationships notes the importance of goal congruence (e.g., Eckman, 2010; Fairhurst, 1993; Stewart, 1991;

Heenan et al., 1999; Hunter et al., 2017). The mechanism through which goal congruence impacts the quality of interactions and exchanges between the leaders is through perceived similarity and better coordination of effort and actions.

The similarity-attraction paradigm (Byrne, 1971) argues that people tend to be attracted to and like others they view as similar to themselves. This paradigm is highly supported in various social psychological fields and has been directly applied to explorations of goal congruence in coworker exchange relationships. For example, research has found that similarity in goals is related to positive reinforcement (Boswell, 2000) and higher quality exchange relationships between leaders and followers (Vancouver & Schmitt, 1991). Further, Fairhurst (1993) argues that these high-quality exchange relationships occur because “values and beliefs converge in discussion, the message is ‘we think alike,’ or ‘we value the same things’” (p. 329). Most research on goal congruence follows this logic, suggesting that goal congruence is an indicator of deep-level similarity (e.g., Hoffman, Bynum, Piccolo, & Sutton, 2011) and is related to greater social integration, more cohesive work relations, and feelings of support (Kristof-Brown & Stevens, 2001).

In addition to increasing feelings of similarity and liking, goal congruence can help direct leadership actions and efforts towards activities valued by both leaders. In a study of top management teams, Colbert, Kristof-Brown, Bradley, and Barrick (2008) found that shared understanding of the importance of specific goals reduced ambiguity about where to allocate effort and actions within the top management team. Reducing ambiguity and increasing predictability of behaviors helps individuals to better coordinate

and anticipate each other's actions, allowing them to have more positive workplace interactions, and in turn improves working relationships.

Decision-making. Although there are often formal power or rank differentials in co-leadership teams that can inhibit equal participation in decision-making processes (Bunderson & Reagan, 2011) that satisfy both leaders, the leaders often must make decisions that need to be jointly accepted. Participative decision-making styles place an emphasis on both members as equals in the process (Dionne, Sayama, Hao, & Bush, 2010), which can have a positive impact on developing a high-quality relationship. For example, Schriesheim, Neider, Scandura, and Tepper (1992) found that high quality leader-follower exchange relationships were related to using more participative decision-making styles as opposed to autocratic styles.

In a review of the current decision-making literature, Larrick (2016) cites the importance of participative decision-making as a buffer against disagreement. This buffer effect occurs because even if one of the leaders has ultimate decision-making power, participative decision-making behaviors can demonstrate transparency, lack of bias, respect, and inclusiveness of all perspectives of those the decision affects (Colquitt, 2001; Larrick, 2016; Lind & Tyler, 1988). The more joint involvement in the decision-making process, the more satisfied members of the organization are with their work overall (Liden, Wayne, & Sparrowe, 2000) as well as greater acceptance of the outcomes (Stevens & Campion, 1994). If both members have a greater satisfaction with their decisions, they are more likely to have positive attitudes towards making decisions together. Further, Bauer and Green (1996) suggest that delegation, an act that often involves joint decision-making, is related to exchange relationship quality because it

reflects positive interactions between individuals (in their study, leaders and followers specifically), which contributes to the development of high-quality relationships. These findings in multiple organizational contexts demonstrate that joint decision-making can reduce disagreement and salience of power differentials, increase feelings of inclusion, value, and equality, and ultimately predict interaction quality and is thus, an important factor in predicting co-leader relationship quality.

Communication. High quality communication may be the most obvious predictor of relationship quality and arguably, underlies all other interactions. Similarly to shared understanding of roles, most if not all of the co-leadership literature notes the necessity of good communication as a main factor impacting development of co-leader relationships (e.g., Alvarez, 2007; Arnone & Stumpf, 2010; Atieno Okech, 2008) and exchange relationships in general (e.g., Bauer & Green, 1996; Fairhurst, 1993; Keyton, 2017; Stevens & Campion, 1994; Tse & Dasborough, 2008).

In a study of co-leadership in counseling, Atieno Okech (2008) suggests, “co-leaders who commit to an ongoing and progressively open sharing of reflections on group dynamics, relationship dynamics, and clinical performance may also experience higher levels of intimacy in their co-leader relationships and enhanced functioning as a group co-leader team” (p. 241; cf. Dugo & Beck, 1997). The author further notes the importance of communication when leaders come from diverse backgrounds and may have different worldviews or interpretations of interpersonal interactions. Overall, good communication increases clarity, reduces ambiguity, and decreases misinterpretation of statements and events, allowing individuals to understand each other better, ultimately

strengthening relationships (Gudykunst, 1991; Stevens & Campion, 1994; Whetten & Cameron, 1991; Wieman & Backlund, 1980).

Conflict management. Conflict management is also one of the most widely identified factors relating to interpersonal relationships in groups or teams. Early organizational and social psychology theorists acknowledge the inevitability of conflict (e.g., Katz & Kahn, 1978) and thus, there has been decades of research on its forms, antecedents and outcomes, and associated behaviors and processes. Bradley, White, and Mennecke (2003) identify conflict management as a key interpersonal skill necessary for effective teamwork. This assertion is well founded in the team effectiveness literature (e.g., Marks et al., 2001; Mathieu & Shulze, 2006) and has also been explored in the leadership literature. For example, Fairhurst (1993) posits that high-quality leader-member exchange relationships are related to less competitive conflict and instead, polite disagreement and constructive conflict.

The notion of constructive conflict has gained traction in the conflict management literature, as demonstrated by several meta-analyses dedicated to uncovering the relationship between conflict and team outcomes, of which several demonstrate contradictory findings (e.g., De Dreu & Weingart, 2003; de Witt, Greer, & Jehn, 2012; O'Neill, Allen, & Hastings, 2013). These recent meta-analyses have revealed several boundary conditions to the impact of conflict on team functions, such as conflict type (e.g., task vs. relationship), team type, and task characteristics. One possible explanation for these divergent findings is that the way in which conflict is managed interacts with these boundary conditions impacting whether conflict is ultimately damaging to the team (Tekleab, Quigley, & Tesluk, 2009). For example, Jehn (1995, 1997) argues that task

conflict is not always detrimental and can increase task performance by introducing new ideas and perspectives. Task conflict has also been shown to be positively related to decision quality (Tjosvold, 2008) and innovation (Chen, Liu, & Tjosvold, 2005). Alternately, relationship conflict is more consistently related to negative outcomes (e.g., De Dreu & Weingart, 2003). These findings highlight the importance of understanding how management of conflict impacts working relationships.

Conflict management has been conceptualized and measured in a variety of ways, with different facets and behaviors described as effective or ineffective (e.g., De Dreu & Van Vianen, 2001; Somech, Desivilya, & Lidogoster, 2009; Tekleab et al., 2009; Tjosvold, 1985). Recently, Gelfand (2018) has synthesized the literature and detailed three dimensions of conflict management that extend findings from social interdependence theory (Deutsch, 1949; Johnson, 2003; Johnson & Johnson, 1989), which suggests that individuals experiencing conflict will either avoid it, react competitively, or react cooperatively. Much of the research stemming from this theory agrees that cooperative reactions are more effective than competitive, but that avoidance may be situationally effective or ineffective.

Gelfand (2018) uses this foundation to suggest behaviors that are effective or ineffective in managing conflict. Specifically, collaborative or avoidant behaviors such as finding solutions that satisfy all parties, examining ideas from all sides to find mutually optimal solutions, or avoiding conflict to maintain the appearance of harmony are considered effective. Alternately, dominating or passive-aggressive behaviors such as fighting for personal gain, forcing others to accept one's point of view, or criticizing others behind their backs are considered ineffective.

It is suggested that the effective behaviors attenuate the negative impacts of conflict on team functioning and engender positive outcomes stemming from constructive conflict. Thus, it can be argued that conflict between co-leaders is not inherently bad; when conflict is rooted in the task, rather than their relationship, and is effectively managed it can have a positive impact on outcomes, limiting the negativity in interactions surrounding conflict. Along the same line, Stevens and Campion (1994) note that constructive conflict can “stabiliz[e] relationships by removing dissociating elements. If conflict is not allowed and addressed, it can build to a point where serious negative consequences may occur, including hostility, reduced performance, and dissolution of the team” (p. 507). Thus, in a co-leader team, constructive and effective conflict management can ultimately have a positive impact on the co-leader’s relationship, or at a minimum, attenuate the possible negative outcomes associated with destructive conflict.

Willingness to learn from each other. Willingness to learn from one another is related to other factors such as participative decision-making and conflict management because each factor involves underlying attitudes towards being open to multiple points of view, an attitude that has been identified as important in maintaining positive exchange relationships at work (e.g., Gerstner & Day, 1997). For example, in their exploration of LMX development, Gerstner and Day (1997) argue that “as leaders and members have new and different experiences together and learn more about each other, it seems likely that this relationship will evolve and grow” (p. 838). This statement reflects more openness to learning *about* each other but learning *from* each other is also important in exchange relationships at work.

For example, a recent study on leader-leader exchange found that mastery goal-orientation, which is characterized by having high motivation to learn, predicted higher quality exchange relationships (Chen & Lin, 2018). The authors suggest that learning goal-oriented individuals tend to see others (in this case their project managers) as “useful sources of work-related skills, knowledge, information, and experience, providing prospects for competence, skill, and knowledge development” (p. 719). In turn, these goal-oriented individuals are more “likely to engage in relatively frequent social exchanges with their project managers in order to discuss and learn how to resolve work-related problems,” and ultimately establish higher quality exchange relationships (p. 719).

In co-leader contexts, it is common for the leaders to have complementary characteristics (e.g., Alvarez et al., 2007; Arena et al., 2011; Hunter et al., 2017) and thus, each leader likely possesses a unique skill- or knowledge-set that can be beneficial to the other. Demonstrating willingness to see each other’s point of view, learning from one another, and acknowledging the unique knowledge or skills each partner possesses can improve the quality of exchanges when making decisions or solving problems. As discussed above, social exchange theory posits that individuals judge their relationship with others based on relational costs and benefits. Acknowledging one another’s unique knowledge or skills signifies that each individual is valued in the co-leadership team, creating psychological benefits such as feelings of gratification and positive attitudes about oneself. These perceptions influence judgements of the benefits of the relationship and in turn feelings about one’s partner.

Unfortunately, a common barrier in these situations is that individuals often have a difficult time admitting deficits in knowledge or skills, viewing this admission as a psychological threat, which can discourage learning behaviors (Argyris, 1982; Druskat & Pescosolido, 2002; Lee, 1997). However, if individuals can overcome this ego-threat and are willing to admit lack of knowledge or skill on a topic, they can ultimately be more successful (Druskat & Pescosolido, 2002). Heenan et al. (1999) supports this assertion in their discussion of critical factors for co-leader success, noting that successful co-leaders have the “ability to subordinate ego to attain a common goal” (p. 11).

Other areas of dyadic research have similarly noted the importance of willingness to learn, such as success in mentor-mentee dyads. Eby et al. (2008) note the importance of positive events and interactions in developing a high-quality relationship between mentor and mentee. Negative attitudes towards learning can result in negative interactions, hindering development of a high-quality relationship. Recent research on mentor-mentee relationships found that mentors had more positive attitudes about their mentor-mentee relationship when mentors perceived their mentee as more willing to learn (Eby & McManus, 2004). Alternately, another study demonstrated that mentees had more positive attitudes about the relationship when they perceived their mentor as more open to mentee learning and development (Eby, Buits, Lockwood, & Simon, 2004), suggesting that general attitudes towards learning play a vital role in this relationship. Often, one member of a co-leader pair has more experience, and thus may take on an informal mentor role, which can be beneficial to co-leadership (Heenan et al., 1999). Although this mentorship role may not occur in all co-leadership situations, the

underlying social exchange process and attitudes regarding the value in learning from others can benefit a variety of workplace relationships.

Supporting and empowering each other. In addition to feelings of gratification and positive attitudes about oneself, support from one's partner is a key psychological benefit often assessed when making judgements of relationship quality. Interpersonal support is marked by providing stability and feelings of self-worth, as well as psychological or material resources to buffer against negative experiences (Cohen & Wills, 1985). For example, support is beneficial because it can act as a stress-relieving defense mechanism as well as impact positive affective and behavioral outcomes (Ducharme & Martin, 2000). Workplace support likely has an impact on co-leaders working relationship as there are work-specific supportive behaviors that can contribute positively to work experiences (Ducharme & Martin, 2000).

An important outcome of certain forms of coworker support is feelings of psychological empowerment, which refers to a state of intrinsic motivation that enriches work life through increased meaningfulness, impact, competence, and choice in one's work (Conger & Kanungo, 1988; Liden et al., 2000). More specifically, meaningfulness relates to the perceived value of the work, impact refers to perceptions that one's behavior makes a difference, competence involves feelings of self-efficacy to successfully carry out the work, and choice involves self-determination and responsibility for one's own actions (Thomas & Velthouse, 1990).

Although these are individual feelings and perceptions, empowerment is inherently tied to exchange relationships because empowerment often occurs at the group level and relies on exchanges between individuals (Liden et al., 2000). Specifically,

perceptions of empowerment are related to support because positive and encouraging social interactions with one's leaders, coworkers, or teammates at work can increase perceptions of self-efficacy and self-determination (Conger & Kanungo, 1988). For example, others' supportive behaviors, such as showing concern (Srivastava, Bartol, & Locke, 2006), sharing power and control, delegation, and encouragement (Conger & Kanungo, 1988) can increase one's feelings of empowerment. Empowered individuals often perform better and are more committed to and satisfied with their work and team through increased intrinsic motivation, self-efficacy, and a sense of self-worth and self-determination (Liden et al., 2000).

It is well founded in the leader-member exchange literature, that providing each other with these forms of support contribute to the maintenance of high-quality relationships (e.g., Fairhurst, 1993). Additionally, the team-member exchange literature notes the importance of care and support in building high quality relationships between members (e.g., Seers, 1989). For example, Tse and Dasborough (2008) interviewed members of work teams and found that "relationship-oriented exchanges (e.g., exchanging care; support and encouragement; and recognizing, appreciating, and helping each other) [were regarded] by team members as important in motivating their relationship development" (p. 210).

Similarly, current research on co-leadership suggests, "to be effective, dual leaders must respect each other's differences and offer emotional support for the others' shortcomings or struggles that they may not have personally encountered" (Hunter et al., 2017, p. 1188). In regard to empowerment, co-leaders not only need to offer each other social support, but need to help motivate each other in their effort to lead. Atieno Okech

(2008) describes how counseling co-leaders often “perceived lack of positive feedback and encouragement from their co-leaders to mean they were ineffective” (p. 185), essentially lowering their feelings of self-efficacy. Further, research on team-member exchange and empowerment suggests that “the extent that coworker exchanges include sharing of power and authority in the completion of the team’s tasks, they support perceptions of self-determination” (Liden et al., 2000, p. 409).

Based on the information above, the following proposition is put forth:

Proposition 1: This set of interactions will be independently and positively related to co-leader relationship quality, such that higher scores on each of these interactions represent higher quality interactions that serve as antecedents to higher quality relational development.

An additional key component in this type of dyadic research is the degree of agreement or congruence on these factors. Congruence in attitudes and behaviors during these interactions may reflect similarity in deeper characteristics, values, and attitudes (Mannix & Neale, 2005; Pelled, 1996; Tsui, Egan, & O’Reilly, 1992) about how to best co-lead the team, such as the degree of overlap in attitudes towards learning from each other. This can affect perceptions of similarity and in turn liking and relationship quality, as perceived similarity is one of the strongest predictors of attraction and friendship (Harrison, Price, & Bell, 1998). Similarity in work-related values also increases the likelihood both individuals will interpret events or problems at work more similarly and in turn be able to predict each other’s behavior, improving the quality of interactions and ultimately, increasing liking.

The link between similarity and liking has been repeatedly been supported through research on the similarity-attraction paradigm (Byrne, 1971), which posits that individuals tend to like those of whom they judge to be similar to themselves. This suggests that it is not only important to consider the average level of relationship quality and liking, but it is also important to consider whether the members of the dyad *agree* that their relationship is positive. Research on exchange relationship agreement, such as LMX, demonstrates that low agreement may be indicative of a poor-quality relationship, which is not always captured with a mean value of relationship quality (e.g., Paglis & Green, 2002).

In addition to predicting relationship quality, congruence on the individual co-leader processes may also reflect the presence of a shared view (i.e., a shared mental model) of how to best co-lead the team. Shared mental models have been shown to relate to better team process and performance because the team members are “on the same page” and can better coordinate their actions, behaviors, and strategies for performance (Klimoski & Mohammed, 1994; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005). These shared mental models can reflect shared views on processes as well as knowledge of the team, task, and each other, which allows team members to anticipate each other’s needs, as well as better coordinate their actions, behaviors, and strategies for success (Druskat & Pescosolido, 2002; Weick & Roberts, 1993).

In the co-leader context, agreeing on what processes and actions are most appropriate for leading the team can improve coordination and joint leadership actions. In the same way that both the average level and the level of agreement on relationship

quality is a key component to understanding this interpersonal process, both metrics are likewise important for understanding this set of co-leader processes. The average value on these predictors is an indicator of the quality of co-leadership processes and the level of agreement can strengthen the impact these processes have on co-leader and team outcomes because they reflect higher congruence in co-leader cognitions and behaviors.

Proposition 2: The level of dyadic congruence on each of the predictors will moderate the relationship between the predictors and dyadic outcomes, such that higher agreement will strength the relationship between the predictors and outcomes while lower agreement will attenuate this relationship.

2) Do both leaders view these factors as equally important to the relationship?

In workplace social exchange relationships, differences between the individuals such as background, experiences, education, training, and power differences can impact the way in which each member views the relationship and what factors may be most important to development of a high-quality relationship. For example, research on LMX suggests that members of a leader-follower dyad may have different perceptions of their relationship (e.g., quality of exchanges; Schyns, Hall, & Neves, 2017) or perspectives regarding the development of the relationship stemming from differences in background, experience, and relative position in the organization (Dockery & Steiner, 1990). Commonly, in co-leadership situations, leaders with different experience levels, education, and training may be strategically placed together because these differences complement each other's strengths and weaknesses. This allows the leaders to learn from each other's unique knowledge and skillset while focusing on different aspects of leading but may also contribute to different perspectives regarding the co-leader relationship.

As mentioned earlier, in addition to differences in these individual characteristics, it is common co-leadership situations for one leader may hold a higher rank or status and in turn have more formal power (Krause et al., 2015). This strategy is meant to help avoid encountering a standstill in which both leaders share equal power and cannot agree on a course of action (De Voogt, 2006). Although this is a common structure in dual leadership situations, power differentials in these leadership structures can fundamentally change the way in which the two leaders interact and may have a negative impact on the relationship between the two leaders (Etzioni, 1965). In their discussion of power in groups, Bunderson and Reagans (2011) suggest that holding power can result in “the tendency to overlook the contributions of others” (p. 1186). This tendency may result in different views of the social relationship stemming from social imbalance between power holders and others with less formal power. In co-leadership situations in which one leader has more formal power, the two leaders may view their relationship differently or place value on different aspects of their interactions as a result of this imbalance.

In regard to the antecedents of co-leader relationship quality put forth, the one factor in particular that may be viewed differently between the co-leaders and may have differential impacts on relationship quality between the dyad members is decision-making. Specifically, the dyad member with lower rank or status who may not have ultimate decision-making power may view participative decision-making behaviors as more important as it relates to relationship quality. One of the key reasons this factor may be differentially important is that granting one leader a higher rank symbolizes higher prestige and value (Etzioni, 1965) and in turn, the leader with lower rank may feel less influential and potentially less valuable in the co-leadership team. Bunderson and

Reagans (2011) suggest that individuals that hold lower positions of status or hierarchy, and in turn have less formal power, within a group often have “fewer opportunities for involvement, participation, and influence – regardless of whether they possess unique or even superior knowledge, perspective, or insight” (p. 1185). Participative decision-making behaviors reduce the salience of power differentials, increase the inclusiveness of all perspectives (Colquitt, 2001; Larrick, 2016; Lind & Tyler, 1988), and signal that both members of the leadership team have input and are of value. These feelings are likely more important to the leader that does not have ultimate authority in making decisions and is, therefore more prone to experiencing inequity in participation and influence. The disadvantaged leader in decision-making instances is likely to notice inequalities or under appreciation regarding their ability to provide knowledge and insight in decision-making situations, and in turn make more negative judgements about the quality of these interactions.

Proposition 3: Participative decision-making will be relatively more important to the leader with lower rank in his or her assessment of the quality of the relationship with his or her leadership counterpart.

3) ***Does relationship quality predict co-leader effectiveness?*** The third research question addresses the antecedents to the co-leaders’ ability to effectively lead together. Previous theorizing on co-leadership suggests that in order to successfully lead their subordinates together, the pair needs to coordinate efforts and be committed to the shared nature of this leadership, as well as spend time building their relationship. The assertion that the relationship is a key factor in co-leader effectiveness can be supported through findings from various exchange theories, such as leader-member exchange theory (LMX;

Graen, 1976) or team-member exchange (Seers, 1989), that demonstrate a link between dyadic relationship quality and valued workplace outcomes. Leader-member exchange theory suggests that leaders and followers develop a relationship through a series of workplace interactions and subsequently, the quality of relationship predicts individual, dyadic, and organizational level outcomes. These relationships can range from purely economic exchange (low LMX) based on “formally agreed on, immediate, and balanced reciprocation of tangible assets, such as employment contracts focusing on pay for performance” (Dulebohn, Bommer, Liden, Brouer, & Ferris, 2012, p. 1717; Blau, 1964), or can become a more socially developed relationship (high LMX) that “engender[s] feelings of mutual obligation and reciprocity” (Dulebohn et al., 2012, p. 1717; Gouldner, 1960; Liden, Sparrowe, & Wayne, 1997). The quality of these exchange relationships have been widely shown to be related to important outcomes such as turnover, commitment, job satisfaction, and performance (Dulebohn et al., 2012).

Although LMX theory was originally developed to describe an exchange relationship between a leader and a follower, the core relational processes involved in this exchange can be applied to different levels. For example, LMX theory has been applied to team member relationships (e.g., Seers, 1989) and to leader-leader relationships (e.g., Herdman, Yang, & Arthur, 2017; Lorinkova & Perry, 2017). Despite the differences in dyad levels, the common core of these exchange constructs is relationship quality, and past research has demonstrated that higher quality exchange relationships are related to effective behaviors and positive employee attitudes (Cropanzano & Mitchell, 2005), as well as satisfaction with each other and organizational commitment (Liden & Masllyn, 1998). Further, research suggests that exchange quality is related to in-role performance

through increased affective commitment (Eisenberger et al., 2010). For example, research on TMX has found that high quality relationships among team members was related to improved individual and team performance because each member is more willing to help each other, provide meaningful feedback, and share information and ideas with each other (e.g., Jordon, Field, & Armenakis, 2002; Liden et al., 2000). Therefore, the quality of co-leader relationship may be related to their ability to work well together through increase job performance and affective commitment towards each other.

In a more specific co-leader setting, Atieno Okech and Kline (2005) noted that failure in co-leader pairs “originate[d] from problems in co-leaders’ relationships...include[ing] failure to coordinate efforts...and co-leader competition,” and concluded that in order for co-leaders to lead effectively together, they must “have a highly functional relationship” (p. 174). Additionally, Stevens and Campion (1994) suggest that higher quality relationships among team members “lead to the antithesis of alienation, frustration, and withdrawal, namely active, willing, and productive participation on the part of all team members” (p. 506), suggesting that positive relationships play a key role in how effectively the members can work together.

Proposition 4: Co-leader relationship quality will be positively related to co-leader effectiveness.

In addition to predicting that co-leader relationship quality will serve as a mediator between the set of antecedent interactions and co-leader effectiveness, it is likely that there is a degree of direct impact of these interactions on co-leader effectiveness. Not only do these antecedents represent a set of workplace interactions, but more specifically, they represent a set of processes in which this leadership team

engages in order to work together and lead their subordinates towards success. A team is defined as, “a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission...”; co-leaders in this context can be considered a small leadership team that interacts and engages in various team processes toward achieving the common goal of effectively leading their subordinates (Salas, Dickinson, Converse, & Tannenbaum, 1992, p. 4). Within the common frameworks for understanding teamwork and team effectiveness, team behavioral and cognitive processes are considered key mechanisms in achieving effectiveness. Specifically, the Input-Mediator-Output-Input (IMOI; Ilgen, Hollenbeck, Johnson, & Jundt, 2005) model of team effectiveness suggests that team cognitive and behavioral processes are key mediators linking team inputs to team outcomes, such as effectiveness.

Marks et al. (2001) define team process as “members’ interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing taskwork to achieve collective goals” over a series of related episodes or interactions (p. 357). Common examples of team processes include strategy formulation, communication, goal specification, team backup behavior, conflict management, motivation and confidence building, and coordination. The set of interactions outlined as antecedents in the present study are similar to many of the processes outlined in the broader literature and therefore, can be considered co-leader team processes that have a key role in co-leader team effectiveness.

Proposition 5: The set of antecedent interactions will be positively, directly related to co-leader effectiveness, such that higher scores on these interactions represent higher quality co-leader team processes that relate to higher co-leader effectiveness.

4) Does relationship quality and co-leader effectiveness impact team effectiveness? The last research question revolves around the ultimate impact co-leaders have on their subordinates. To start, co-leader effectiveness has a direct impact on team effectiveness in the same way that leaders in more traditional structures do. The importance of leadership on subordinate or team outcomes has been widely demonstrated and the importance of team leadership can be specifically supported through various team leadership theories. In general, team leaders impact team effectiveness by successfully providing direction and instruction for collective action that allows team members to work well together to accomplish tasks (Zaccaro, Heinen, & Shuffler, 2009). Further, effective team leaders plan and organize, motivate subordinates, assess team performance, assign tasks, develop subordinate knowledge, skills, and abilities, and create a positive team atmosphere, all of which contributes to increased team effectiveness (Salas, Sims & Burke, 2005).

In the co-leader context, each leader has the opportunity to individually provide effective leadership for their team, and when co-leaders are effective together it can increase the overall amount of leadership resources available to their subordinates. In addition to providing key leadership resources such as instruction and direction, effective co-leaders differentiate themselves from ineffective co-leaders by providing *consistent* information regarding team goals and actions for task completion to their subordinates. If the leaders are not effective together, the team is more likely to get inconsistent

information and instruction from each source and may be confused about expectations or actions necessary to accomplish the task or goal.

Arguments against co-leadership structures specifically target the issue of consistent instruction for subordinates. For example, the unity-of-command perspective (Barnard 1968, Gulick & Urwick, 1937; Simon, 1997) that served as the basis for organizational structure for many years, contests that the presence of multiple leaders leads to confusion and inefficiency among subordinates (Gulick & Urwick, 1937). However, proponents of distributed leadership structures argue that unity in command and instruction does not require a single leader, co-leaders that are effective together are more likely to be unified in their command of subordinates because they share views in how to lead together and are more congruent in their goals and plans for their subordinates in comparison to ineffective co-leaders. Hunter et al. (2017) suggests that effective co-leaders have a shared mental model of leading, which helps “ensure that one leader does not encourage or direct subordinates toward a goal that would be at odds with his or her co-leader’s goals” (p. 1189). As long as the leaders provide consistent, non-contradictory instruction, their subordinates should benefit from the increased leadership resources available to them.

Proposition 6: Co-leader effectiveness will be positively related to team effectiveness.

Additionally, relationship quality may also directly impact team effectiveness by modelling effective or ineffective interpersonal behaviors and coworker relationships to subordinate team members. Theories of how individuals learn and model behaviors offer insight into how characteristics of co-leader’s working relationship may impact

subordinate team effectiveness. For example, social learning theory (Bandura, 1977) suggests that individuals learn and mimic the behavior of the role models around them. The theory suggests that individuals are more likely to choose models that are considered attractive or credible. Leaders are often viewed as more credible, legitimate models given their position in the organization, and therefore serve as key role models to their subordinates (Mayer, Aquino, Greenbaum, & Kuenzi, 2012). As subordinates progress through their jobs and careers, they look to their environment and leaders around them to learn norms of appropriate behavior (e.g., social information processing theory; Salancik & Pfeffer, 1978) and develop schemas of appropriate behavior based on their experience with their current leaders (Wofford & Goodwin, 1994) and in turn mimic those behaviors.

Current research uses social learning and social information processing theories as frameworks to describe how subordinates learn and model both positive and negative behaviors from their leaders, suggesting that leader behaviors “trickle down” to subordinates, who learn and mimic those behaviors. For example, Mawritz, Mayer, Hoobler, Wayne, and Marinova (2012) found that abusive supervisor behavior trickled down through the different levels of an organization and ultimately led to work group interpersonal deviance among the lowest level of subordinates. Alternately, Mayer et al. (2012) found that subordinates are also more likely to mimic positive behaviors from their leaders, such as ethical behavior.

The same logic can be applied to the effects of modelling effective teamwork and interpersonal behaviors to subordinates, behaviors that are key in their learning and development of positive ways to interact with each other and in turn perform better and

be more satisfied with their team. Co-leaders that model positive relationships and interactions with each other are more likely to teach subordinates effective interpersonal teamwork processes in comparison to co-leaders that model destructive relationships and interactions.

Proposition 7: Co-leader relationship quality will be positively related to team effectiveness.

Similarly, it is possible that the co-leader interactions outlined as antecedents to relationship quality and co-leader effectiveness may also have a direct impact on team effectiveness. Co-leaders may not simply model effective relationships, but they may also model the effective processes that lead to effective relationships. For example, if the co-leaders model effective processes such as high-quality communication and conflict management with each other, subordinates may also learn how to engage in these positive communication and conflict management processes amongst themselves, ultimately leading to positive team outcomes.

Proposition 8: Higher quality co-leader processes and interactions will be positively related to team effectiveness.

The role of time in the model. An additional consideration not explicated in the four main research questions is the role of time in building and maintaining effective working relationships. Building relationships and negotiating roles as co-leaders and the ultimate impact on subordinates is a cyclical process with interactions, relationship quality, and outcomes impacting each other over time. Research on interdependence theory suggests that once individuals have initial interactions and become known to each other, their relationship and subsequent interactions are influenced by the history of past

interactions and the expectations for future interactions (Hinde, 1976). Additionally, the most widely used model of team effectiveness (the IMO model; Ilgen et al., 2005) suggests that team functioning is a cyclical process in which outputs (such as performance and member attitudes) become inputs over time; thus, dyad and team outcomes likely impact subsequent co-leader behavioral and attitudinal inputs.

Proposition 9: The proposed model functions cyclically, such that the dyadic and team outcomes will serve as subsequent inputs over time.

Hypotheses Overview

The complexities of the proposed co-leadership process preclude simultaneous analysis of the full model with the current sample of Army co-leaders, and therefore, several of the propositions as well as causal and indirect relationships will not be directly tested. However, the sample does allow for a subset of these propositions to be assessed and seek preliminary evidence for the proposed model. Thus, the following testable hypotheses are put forth:

***Hypothesis 1:** The set of co-leader interactions (understanding of role expectations, participative decision-making, goal congruence, communication, conflict management, attitudes towards learning, and support and empowering each other) will each be independently and positively related to co-leader relationship quality.*

***Hypothesis 2a-2g:** The level of dyadic congruence on each of the predictors (a. understanding of role expectations, b. participative decision-making, c. goal congruence, d. communication, e. conflict management, f. attitudes towards learning, and g. support and empowering each other) will moderate the*

relationship between the predictor and co-leader relationship quality, such that higher agreement will strengthen the relationship between the predictor and relationship quality while lower agreement will attenuate this relationship.

Hypothesis 3: *Participative decision-making will be a relatively more important predictor of co-leader relationship quality to the leader with a lower rank in the organizational hierarchy.*

Hypothesis 4: *Co-leader relationship quality will be positively related to co-leader effectiveness.*

Hypothesis 5a-5g: *Each co-leader interaction (a. understanding of role expectations, b. participative decision-making, c. goal congruence, d. communication, e. conflict management, f. attitudes towards learning, and g. support and empowering each other) will each be independently and positively related to co-leader effectiveness.*

Hypothesis 6: *Co-leader effectiveness will be positively related to team effectiveness.*

Hypothesis 7: *Co-leader relationship quality will be positively related to team effectiveness.*

Hypothesis 8a-8g: *Each co-leader interaction (a. understanding of role expectations, b. participative decision-making, c. goal congruence, d. communication, e. conflict management, f. attitudes towards learning, and g. support and empowering each other) will be positively related to team effectiveness.*

Contribution to the literature

Overall the current study contributes significantly to the literature on co-leadership by drawing from and synthesizing multiple streams of research on social exchange relationships, team functioning, and co-leadership to propose and test aspects of a theoretical model of predictors of co-leadership success. Further, much of the current research on co-leadership is based on publicly available, archival organizational data, or qualitative case studies of current co-leaders. Thus, the current paper also contributes to the leadership research by providing a methodological middle ground by empirically, quantitatively testing many of the assertions that remain untested by collecting quantitative data from a larger number of current co-leaders.

Chapter 3: Methods

Participants and Procedure

Sample

Army participants were recruited as part of a larger data collection effort and the original sample was comprised of 78 PLs (PLs), 88 PSGs (PSGs), 1 unidentified PL or PSG, 545 subordinate platoon members, and 50 company commanders (CCs). Due to limitations during data collection, not all co-leader pairs had complete dyadic data and not all subordinate (platoon members) and superior (company-level leaders) participants fell into the same chain of command as the co-leader dyads and therefore, the final sample represents a subsample of the data collected. For the co-leader dyadic data, only complete dyads were used for these analyses; however, data from all PLs and all PSGs (paired or unpaired within the sample) were retained for the individual level hypothesis regarding relative importance of the antecedents. PL and PSG participants that did not represent a typical co-leader pair (e.g., no counterpart, or atypical counterpart) were removed from the sample ($n = 6$) because they did not represent the Army population of interest (i.e., PL-PSG co-leader pairs). Additional information regarding the handling of missing data are detailed below. The final useable sample consists of 76 PLs and 85 PSGs in total and 49 complete co-leader dyads, 201 subordinate platoon members in teams linked with 29 co-leader dyads, and 22 company level supervisors (i.e., CCs) linked with 31 co-leader dyads. The number of participants per platoon ranged from 2-14 team members.

Missing data. Missing data was handled using recommendations from Newman (2014). Missing data and all subsequent decisions were based on the total response rate

for each group and the type of missingness (i.e., person, construct, or item). The three types of missingness that need to be assessed are person-level (i.e., no-shows and participants who did not complete any of the survey), construct-level (i.e., participants who responded to at least 1 construct), and item-level (i.e., participants who responded to at least 1 item from a given construct). Newman (2014) provides guidelines for handling missing data based on the amount of missingness in each category. Specifically, 1) if the person-level non-response rate is greater than 30%, conduct a sensitivity analysis, 2) if the construct-level partial response rate is greater than 10%, use multiple imputations or maximum likelihood to replace missing data, and 3) if there is item-level missingness but the analysis is at the construct-level, use each person's available items to represent the construct, regardless of the amount of missingness (i.e., replace all missing items with that participant's mean value for that construct).

Army data collections are limited in information regarding how many participants have been “contacted” and how many show up for the survey. Potential participants that do not show up to the physical survey location typically have no information about the survey, and therefore, cannot be reliably counted as non-responders (i.e., participants that were contacted or aware of the survey opportunity but did not respond). Therefore, response rate was calculated based on the number of individuals that were given that chance to respond to the survey (i.e., came to the location in which the survey was administered) and chose not to respond. Participants who responded to all items, but demonstrated signs of poor data quality (e.g., responded all 1s) were calculated as “non-responders.” Participants were also removed if they did not represent the population of interest (6 number of people fell into this category). Researchers requested PL-PSG

pairs, the platoons they oversee, and their direct supervisors. Many data collections occur in the same building and it is possible some respondents participated in the incorrect survey, and therefore these participants may not represent the population of interest. These participants were identified based on their demographic responses and removed. The response rates for each group is presented below.

For the PL and PSG group, 168 surveys were administered. Of those 168 individuals, the total response rate was 99.4% (full responders = 163 participants or 97%, partial responders = 4 participants or 2.4%, and non-responders = 1 participant or .6%). Newman (2014) suggests that when the response rate is close to 100%, there is little chance of missing data bias, suggesting that missing data in our sample of PL-PSGs is not a large concern. Further, because our partial response rate (i.e., missing data on full constructs) was below 10%, Newman (2014) suggests that advanced imputation methods (e.g., maximum likelihood or multiple imputations) provide no benefit over pairwise deletion. Therefore, for the PL-PSG group, non-responders were eliminated from the sample and pairwise deletion was used for partial responders. Item-level missingness was handled through “mean_{person} imputation” (i.e., “mean substitution across items within an individual”; Newman, 2014; Roth, Switzer, and Switzer, 1999, pp. 214, 222).

For the subordinate platoon members, 545 surveys were administered. Of those 545 individuals, the total response rate was 96.7% (full responders = 472 participants or 86.6%, partial responders = 55 participants or 10.1%, and non-responders = 12 participants or .02%). Based on Newman’s (2014) suggestions detailed above, missing data for the subordinate platoon members was handled in the same manner as with the PL-PSG co-leader dyads. Although the partial response rate is close to the 10% cutoff,

some of the missing constructs are due to extenuating circumstances within the platoon. For example, some of the platoons may not have a PL, and therefore have missing data on the co-leader effectiveness construct. These platoons were eliminated based on our target population. As a result, the partial missingness response rate is slightly inflated. The only useable data from the platoon member sample for this particular study was from individuals in platoons that could be linked to a co-leader pair for the aspects of the model involving this multi-source data. Platoons were included if two or more members participated and the team could be linked to a co-leader dyad. Of the total number of responders (545), 207 individuals in 29 teams were linked to PL-PSG dyads. Of those 207 individuals, 6 were removed for responding to 160 questions on their scantron when there were only 134 questions in the survey. This suggests these participants did not pay attention and therefore were removed. Therefore, the final sample size for platoon members was 201.

For the company-level supervisors, there response rate was 100% from the 50 company commanders. There was no construct-level missingness; however, the one exception to this was for company-level leaders that were rating platoons with extenuating circumstances (i.e., missing a PL). In these instances, the company level leader did not respond to the co-leader effectiveness scale. These platoons would not have been included in the analysis and the data in these instances was not considered missing. Additionally, there was very little item-level missingness. One company commander missed one item and another missed two items. Given the low amount of item-missingness, these three items were replaced with the mean value for that participant on that scale, consistent with how item missingness was handled for the co-

leader dyads and their subordinate team members. Similar to the subordinate platoon members, the company level leaders that were included in the final analyses were leaders that could be linked to the participating co-leader dyads ($n = 22$ linked to 31 dyads).

Procedure

Participants were recruited through Army organized data collection weeks over the course of several months. Each Brigade in the Army is required to provide access to Soldiers for participation in research over the course of one week during the year. The number of participants at each base was dictated by how many Soldiers were available during that week and participant requests per Army base ranged from 5-10 intact platoons (i.e., the platoon co-leaders and their subordinates) and their company-level leaders. Data collection at each base lasted 2-4 days depending on the number of available participants at that base.

There were three separate session types dividing participants into groups based on their rank to avoid sessions in which participants responded to the surveys in the presence of their superiors. First, CCs were surveyed to provide ratings of their subordinate PL-PSG pairs, and their subordinate platoons. Next, PL-PSG dyads were asked to arrive together to try and obtain data from as many complete dyads as possible. During these sessions PLs and PSGs were asked to sit on opposite sides of the room as their counterpart to ensure privacy and truthful responding regarding their working relationship. Lastly, subordinate platoon members participated with their team. Entire platoons would not typically be made available, and thus the subordinate members represent a subset of the larger team. In each of the three types of sessions, participants independently completed a paper-and-pencil survey with a demographic section followed

by a set of multiple choice and/or open-ended survey items independently. Sessions for PL-PSG dyads and platoon members lasted 1 hour and sessions for company level leaders lasted up to 45 minutes.

Soldiers provided information identifying their platoon, company, battalion, and brigade in order to link individual responses to the team and chain of command to which they belong. Once all data was linked, identifying information for the current project was removed from the data files and replaced with an anonymous team identifier (i.e., a number from 1-300 was assigned in order as data was entered). In addition to creating anonymous team identifiers, participants were ensured all data would be reported at the group level and participants were informed that their responses are anonymous and confidential in order to minimize the potential for biased responding (see Appendix B for informed consent and C for pre-survey script).

Measures

The following list of measures is presented by level of analysis and Figure 1b provides additional visuals of which groups completed each measure (Appendix D provides a full list of items for each measure). All measures were selected based on items that best matched the constructs presented in the theoretical model that was derived from the original qualitative investigation of PL-PSG co-leader pairs.

Several measures for each survey were not originally written with the dyad or team as the item referent and thus, item referents were adapted to the appropriate level when necessary. Additionally, all surveys items were required to be written at an 8th grade reading level as is standard for plain language requirements in all Army literature (see Appendix D for all original items and adapted wording).

Figure 1b

Theoretical Model of Antecedents and Outcomes of Co-Leader Relationship Quality by Data Source

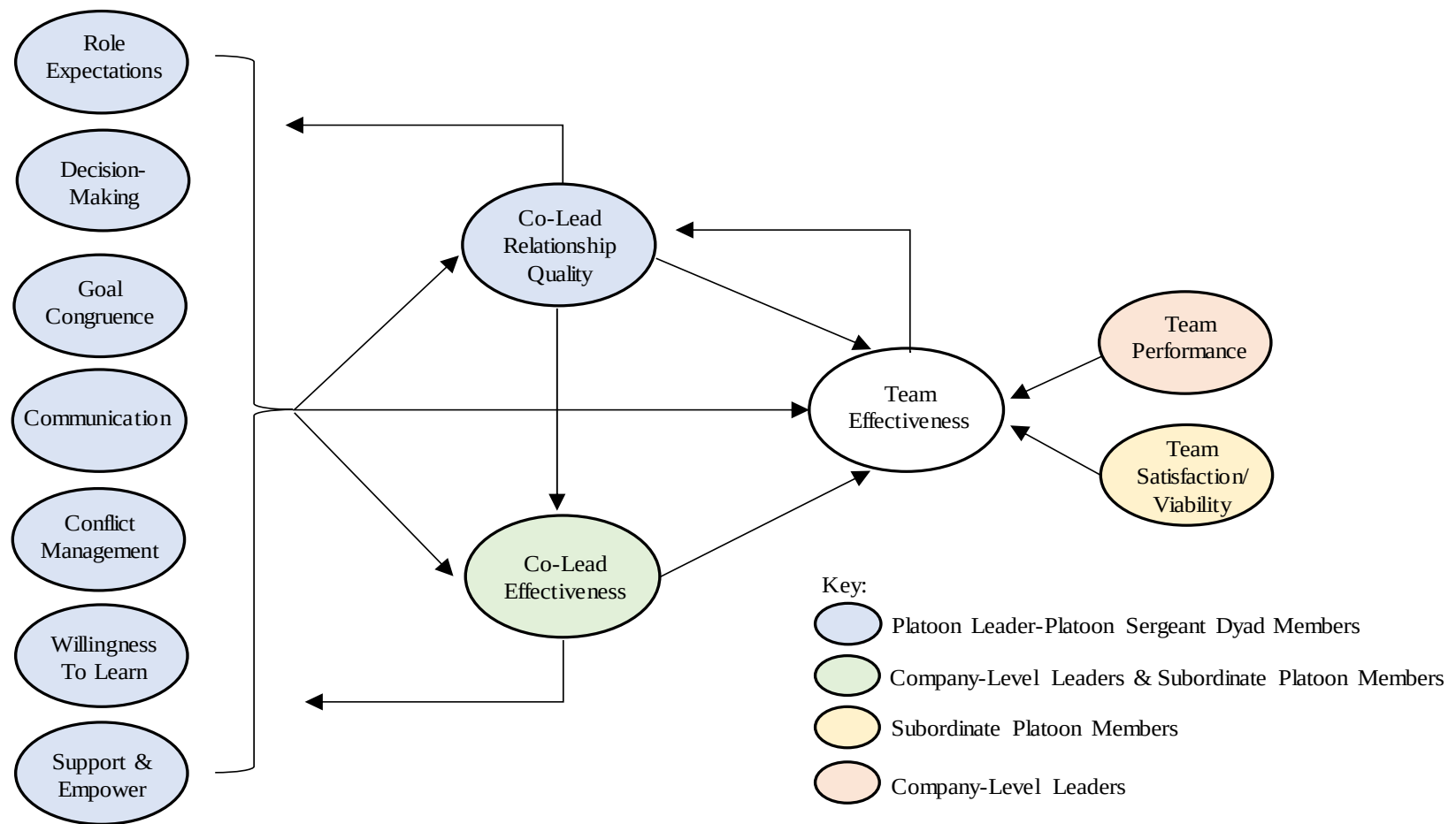


Table 1
Participant demographics

		Ranks						Platoon Tenure			Company Tenure			Army Tenure		
Full Participant Group	<i>n</i>	1LT	2LT	-	-	-	-	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Platoon Leaders	76	49	27					7.08	4.33	> 1-20	8.71	6.03	> 1-36	44.78	33.70	6-168
	<i>n</i>	SGT	SSG	SFC	-	-	-	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Platoon Sergeants ^a	81-85	1	39	41				11.56	8.60	1-48	15.04	11.25	1-60	163.59	49.01	32-323
	<i>n</i>	2LT	CPT	MAJ	-	-	-	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Company Commanders	22	2	19	1				-	-	-	10.05	7.12	2-36	93.73	37.95	15-203
	<i>n</i>	1LT	CPL/SPC	PFC	PVT	SGT	SSG	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Subordinate Platoon Members ^a	187-191	2	89	58	24	13	5	14.24	9.66	> 1-47	15.71	10.11	> 1-47	34.73	29.36	5-182
		Ranks						Platoon Tenure			Company Tenure			Army Tenure		
Co-Leader Dyads	<i>n</i>	1LT	2LT	-	-	-	-	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Platoon Leaders	49	35	14					6.84	4.06	1-16	14.97	11.06	1-60	43.43	29.30	6-132
	<i>n</i>	SGT	SSG	SFC	-	-	-	<i>M</i>	SD	Range	<i>M</i>	SD	Range	<i>M</i>	SD	Range
Platoon Sergeants	49	1	21	27				11.56	6.82	1-30	8.43	5.24	1-26	165.65	44.84	66-293
	<i>n</i>	<i>M</i>	SD	Range												
Co-Leader Dyad time together	49	5.89	3.58	1-16												

Note. ^a = Sample size for tenure descriptive statistics ranges due to participant non-response on these demographics.

Demographics. All participants were asked to identify their rank, tenure in the military, current team (i.e., platoon and/or company within a battalion and brigade), as well as amount of time in their current platoon and in their current company. Participant demographics are presented in Table 1.

Dyad-level measures. PLs and PSGs completed several measures regarding their working relationship and behaviors as detailed below.

Shared understanding of role expectations. A 10-item measure of role ambiguity (Sawyer, 1992) was used to determine the extent to which the co-leader dyad members understand their own role, their counterpart's role, and their role as a co-leadership team. Sawyer's (1992) measure consists of ten items representing two facets, goal and process clarity.

Past research has argued that individual's roles are often embedded in a team context and therefore, understanding how one's own role fits into the team provides evidence that role clarity can operate both at an individual level as well as a higher dyad or team level. Therefore, Sawyer's (1992) original items were adapted to the dyad level. Within the higher-level context, the facet of *goal clarity* "indicates that team members as a whole clearly understand their subgoals and the connection between their work and the team's objectives," and the facet of *process clarity* "implies that team members clearly comprehend the procedures that must be followed in order to achieve goals" (Hu & Liden, 2011, p. 852).

Participants were asked to "indicate the level of certainty you feel about each of the following statements in regard to you and your counterpart's roles and responsibilities." Example items include "the goals and objectives for our respective

jobs” (goal clarity), and “how we both should divide our time among the tasks required of our jobs” (process clarity). Response options range from 1 (*very uncertain*) to 7 (*very certain*) and reported internal consistency for the goal clarity facet is .92 and for the process clarity facet is .90 (Sawyer, 1992).

Decision-making style. Decision-making style was measured using a 6-item facet from a measure of empowering leadership, participative decision-making (Arnold, Arad, Rhoades, & Drasgow, 2000). The facet of participative decision-making “refers to a leader’s use of team members’ information and input in making decisions” which includes behaviors such as “encouraging team members to express their ideas and opinions.” Example items include “we use each other’s suggestions to make decisions that affect the team” and “we give each other a chance to voice our opinions.” Response options range from 1 (*never*) to 7 (*every time*) and reported internal consistencies for this scale range from .86 to .92 (Arnold et al., 2000).

Goal congruence. Goal congruence was measured slightly differently from the other survey items. Rather than using Likert-type items, participants were asked to list the top 5 goals for their platoon. Congruence in these lists of goals was defined as the amount of overlap in goals between the PL and PSG. Platoon goals may vary greatly based on factors such as installation location, mission, or team specialty, for example. As a result, it was not feasible to create a predetermined list of goals in which participants rate importance that may apply to platoons across all data collection sites and specialties. Thus, each leader was asked to “list the top five goals that are most important for the platoon over the following 6 months.” Due to the open-ended nature of this measure, coding congruence in goals can be challenging. In order to create a clear standard for

rating goal similarity across dyads, goals were coded into five categories representing key Army job performance competencies developed through prior Army research (Campbell, McHenry, & Wise, 1990).

The original research on these Army competencies conducted by Campbell et al. (1990) was meant to gain a comprehensive view of the competencies necessary for a wide range of Army entry-level positions across Military Occupational Specialties (MOS). Because PL-PSG pairs are primarily responsible for leading and developing a team of entry-level Soldiers, the competencies derived from this research likely align with goals PLs and PSGs have for their platoon. The five performance competencies are: 1) core technical proficiency, 2) general soldiering proficiency, 3) effort and leadership, 4) personal discipline, 5) physical fitness and military bearing. Campbell et al. (1990) provide the following definitions for these competencies (p. 322):

- Core technical proficiency: “This performance construct represents the proficiency with which the soldier performs the tasks that are ‘central’ to the MOS. The tasks represent the core of the job and they are the primary definers of the MOS.”
- General soldiering proficiency: “Individuals in every MOS also are responsible for being able to perform a variety of general soldiering tasks... Performance on this construct represents overall proficiency on these general soldiering tasks.”
- Effort and leadership: “This performance construct reflects the degree to which the individual exerts effort over the full range of job tasks, perseveres under adverse or dangerous conditions, and demonstrates leadership and support toward peers. That is, can the individual be counted on to carry out assigned tasks, even

under adverse conditions, to exercise good judgment, and to be generally dependable and proficient? While appropriate knowledges and skills are necessary to successful performance, this construct is meant to reflect the individual's willingness to do the job required and to be cooperative and supportive with other soldiers.”

- Personal discipline: “This performance construct reflects the degree to which the individual adheres to Army regulations and traditions, exercises personal self-control, demonstrates integrity in day-to-day behavior, and shows a commitment to high standards of personal conduct.”
- Physical fitness and military bearing: “This performance construct represents the degree to which the individual maintains an appropriate military appearance and bearing and stays in good physical condition.”

Although these definitions refer to the “individual” Soldier rather than the “team,” these goals can be considered team-level because, as mentioned, the platoon co-leaders are responsible for developing these skills in all subordinate members of their platoon. For example, a goal of *physical fitness and military bearing* for the team would be “to achieve an average fitness test level of 270.” In this instance, all individual soldiers need to demonstrate a relatively high level of physical fitness for the team to achieve this goal.

Goals were coded blindly by two independent coders (i.e., in a random unidentified order as to not be influenced by knowledge of which goals match each member of the dyad) into one of the five competencies and a sixth category, other, for goals that did not fit into the five categories. Initial coder agreement was 84.69% after coding the first 20% of goals listed. Coders then met to discuss discrepancies to improve

agreement. Overall agreement after coding the remaining goals was 91.02%. All disagreements were discussed to reach 100% agreement on the final list of coded goals. Once all goals were coded, scores for each dyad were calculated based on how many of the goals listed are overlapping. Scores ranged from 0 (*no overlap*) to 5 (*total overlap*).

Communication. Quality of communication within the dyad was measured using Earley & Gibson's (2002) 7-item scale of team communication. Example items include "there is poor information flow between us," and "one of us tends to dominate the discussion." Response options range from 1 (*very inaccurate*) to 7 (*very accurate*). Internal consistency is .78.

Conflict management style. Conflict management style was measured using Gelfand's (2018) 15-item conflict culture scale. This scale assesses conflict behaviors that range in how productive they are in handling conflict and fall into three categories: dominating/passive-aggressive, collaborative, and avoidant. This scale was originally developed as an indicator of conflict culture within teams or organizations but was modified to reflect dyad-level behaviors. Participants were asked to "please indicate the extent to which you agree or disagree with the following statements about how you and your counterpart manage conflict." Example items include "we criticize each other behind each other's backs" (dominating/passive aggressive), "we examine ideas from all sides to find a mutually optimal solution" (collaborative), and "we are very reluctant to openly talk about conflict" (avoidant). Responses range from 1 (*strongly disagree*) to 7 (*strongly agree*) and reported alphas for each facet are .90 (dominating/passive aggressive), .91 (collaborative), and .75 (avoidant; Gelfand, 2018).

This scale is relatively new and has not been widely cross-validated outside of the original research by Gelfand (2018) and therefore, a confirmatory factor analysis (CFA) was conducted using all available PL and PSG participants ($n = 166$) to ensure replicability of the original factor structure. All CFAs reported below were fit using the Lavaan package (Rosseel, 2012) in R version 3.5.1. First, a CFA was fit specifying the author's original three factors. Model fit was assessed using Hu and Bentler's (1999) guidelines ($RMSEA < .06$, $CFI > .95$, $SRMR < .08$). Values that are close to these cutoff points are considered acceptable fit and RMSEA values were assessed based on the 90 percent confidence interval around the value. Using these guidelines, this model did not demonstrate good fit ($\chi^2(90) = 282.76$, $p < .001$; $CFI = .826$, $RMSEA = .114$ [90% CI = .10, .13], $SRMR = .133$).

In addition to relatively poor model fit with the originally developed three-factor structure, inspection of item distributions suggests that participants responded to items as simply "positive" or "negative." More specifically, the distributions for items 8, 9, 10, and 11 (see Appendix D for list) were negatively skewed and the distributions for all other items were positively skewed. This suggest that this scale is likely susceptible to social desirability bias and participants tended to respond to items based on whether items were viewed as generally positive or negative behaviors. Based on these item characteristics, a second CFA was fit in which a bifactor model was hypothesized.

A bifactor model helps determine whether there is a general factor that is accounting for the covariance among the manifest variables. In other words, it helps answer the question of whether there is an unmeasured second-order factor that influences responses to the items that is not accounted for in the originally hypothesized

3-factor model. In this case, social desirability bias may be the unmeasured influence in the way in which participants responded to the items. Rather than items reflecting three distinct factors, participants simply responded to the positive or negative valence of the items driven by social desirability.

This model demonstrated slightly better fit in comparison to the 3-factor model ($\chi^2 (75) = 228.99, p < .001$; CFI = .861, RMSEA = .111 [90% CI = .10, .13], SRMR = .073). In addition to demonstrating better fit, the interpretation of a bifactor model aligns with the interpretations of the item characteristics (skewed distributions) and provides additional evidence that the main difference in the way participants responded was due to underlying influences such as social desirability.

Although the bifactor model presents better fit in comparison to the original 3-factor model, the fit indices do not meet the standards for “good” fit. As a result, two additional CFAs were conducted to assess fit with a 1-factor model as well as a standard 2-factor model (this differs from the bifactor model because of the absence of a second-order unmeasured factor influencing manifest variables). Neither of these models demonstrated better fit in comparison to the bifactor model, suggesting that the bifactor model is the most appropriate to use for subsequent hypothesis testing despite its mediocre fit. Due to the assumption that the second-order factor influencing participants’ responses involves social desirability biases, this model allowed for scale items to be combined into one average conflict management score in which all negatively worded items were reverse coded and averaged with the positively worded items, resulting in one overall conflict management score for each participant and each dyad. Internal consistency for the full scale after reverse scoring the negatively worded items was .80

Learning from each other. Participants willingness to learn from their counterpart was measured using a 7-item facet from Gladstein's (1984) learning capacity/cooperative learning scale, promotive interaction. Cooperative learning is defined as "team members [working] together to maximize their own as well as other team members' learning" (Janz, Wetherbe, & Davis, 1997, p. 48; Johnson, Johnson, Buckman, & Richards, 1988). This scale includes the facets of positive interdependence, promotive interaction, and group process; however, the items from the promotive interaction scale best match the intended content of this construct and so only this subset of items was used.

Promotive interaction is defined as "the degree to which members of the group identify the individual strengths and weaknesses in the group and try to help others develop the skills necessary for the group to achieve its goal through explaining or teaching" (Janz et al., 1997, p. 48). Example items include "we can learn important things from each other," and "we like to share our ideas and work materials with each other when we think it will help." Responses range from 1 (*strongly disagree*) to 7 (*strongly agree*) and reported internal consistency for this facet is .86 (alpha for the entire scale = .70; Janz et al., 1997).

Supporting and empowering each other. Co-leader support for each other was measured using a 10-item facet of Arnold et al.'s (2000) empowering leadership scale, showing concern/interacting with the team. This facet is defined as "a collection of behaviors that demonstrate a general regard for team members' well-being. This category include[s] behaviors such as taking time to discuss team members concerns" (Arnold et al., 2000, p. 255). Example items included, we "care about each other's

personal problems” and “show concern for each other’s success.” Responses range from 1 (*never*) to 7 (*every time*) and reported internal consistency for the scale ranges from .89-.94 (Arnold et al., 2000).

Relationship quality. Co-leader relationship quality was assessed with a modified version of a multidimensional leader-member exchange scale. Although this scale is designed to measure relationships between leaders and subordinates, the item referents were modified to reflect the dyad’s relationship and the content of the items remains relevant regardless of the referent. Liden & Maslyn’s (1998) 12-item multidimensional scale of LMX was chosen because of the inclusion of the more detailed four facets: affect, loyalty, contribution, and professional respect. The items from these facets best reflected the content of the intended working relationship construct.

Example items include “I like my counterpart very much as a person” (affect), “my counterpart would defend me to others” (loyalty), “I do work for my counterpart that goes beyond what is specified in my job description” (contribution), and “I respect my counterpart’s knowledge of and competence on the job” (professional respect). Responses range from 1 (*strongly disagree*) to 7 (*strongly disagree*) and reported internal consistency for each facet is .90 (affect), .78 (loyalty), .74 (contribution), and .92 (professional respect; Liden & Maslyn, 1998).

Personal experiences. In addition to the quantitative measures of the variables in the proposed model. Participants were also provided an opportunity to share personal experiences in a set of open-ended questions at the end of the survey. Example questions include “what impacts the quality of the relationship between you and your counterpart?” and “how does your relationship with your counterpart impact your platoon?”. They

were also asked questions such as “provide specific experiences that stand out that have been negative in your relationship.” These qualitative responses were not part of the formal hypothesis testing but were used to provide supplementary support for the proposed relationships in the model.

Team-level measures.

Platoon Effectiveness. In a recent review of research on teams, Mathieu, Hollenbeck, van Knippenberg, and Ilgen (2017) suggest that team effectiveness is context specific and should be measured through multiple levels and multiple constituencies (cf. Hackman & Morris, 1975). In order to accomplish this, effectiveness ratings should come from various sources and should include tangible outputs as well as members’ reactions (Mathieu et al., 2017). Therefore, platoon effectiveness was measured at the team level and responses to different aspects of effectiveness were gathered from subordinate platoon members and company level leadership.

Platoon performance. An Army-specific scale of platoon performance served as a measure of the tangible outcomes relevant to Army platoons across all military occupational specialties. Currently, the Army does not have a standard measure of platoon performance and thus the measure used is currently undergoing validation. This measure includes 11 items that have been deemed most relevant to platoons by Army subject matter experts. Company level leaders (i.e., CCs) completed this measure for all platoons they oversee and these scores were used as supervisor ratings of team performance.

Instructions asked participants to “please use the scales provided to rate the performance of this platoon.” The first three items ask participants about general platoon

performance. An example item is “how would you rate the platoon’s overall performance?” Responses ranged from 1 (*very low*) to 5 (*very high*). The second cluster of items asked participants about more specific types performance on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Example items include “this platoon demonstrates a high level of overall military/operational effectiveness,” “this platoon demonstrates a high level of overall mission readiness,” and “this platoon is well prepared to perform its Mission Essential Task Lists (METLs).” Because these two sets of items were on two different scales, a linear transformation was performed on the first three items to transform the items to a 7-point scale to then be averaged with the remaining items.

Platoon member satisfaction and viability. Team member satisfaction and viability are considered important components of team effectiveness and should be used in conjunction with team performance when assessing overall effectiveness (Hackman, 1987). Subordinate platoon members provided data for these two components of team effectiveness. Member satisfaction and viability was measured using Tesluk & Mathieu’s (1999) 7-item scale of platoon member attitudes. Platoon members were asked to “please indicate the extent to which you agree or disagree with the following statements” on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

The member satisfaction facet of this scale is defined as an affect-based emergent state that is related to “affective feelings that team members hold toward each other and the team (Ilgen et al., p. 526). Example items for this facet include “I really enjoy being a part of this team,” and “I feel like I get a lot out of being a member of this team.” Reported internal consistency for this facet is .91 (Tesluk & Mathieu, 1999).

The member viability facet is defined as “the degree to which group members wish to work together as a team in the future” (Tekleab et al., 2009, p. 180). Example items for this facet include “if I could choose to, I would work with this team again in the future,” and “If I could choose to, for future assignments, I would hope to be with a similar team.” Items included the caveat “if I could choose to” because Soldiers in the Army are assigned to units and do not have the ability to select in and out of teams. Reported internal consistency for this facet is .70 (Tesluk & Mathieu, 1999).

Co-leader effectiveness. In addition to assessing platoon effectiveness, company level leaders and subordinate team members were asked to rate the PL-PSG dyad on their effectiveness as co-leaders. Items were adapted from the General Leadership Impression Scale (Lord, Foti, & De Vader, 1984), changing the referent from an individual leader to co-leaders. This scale contains five items and examples include “how instrumental are your/the leaders to the overall effectiveness of the platoon” and “how much do your/the leaders contribute together to the performance of the platoon’s task?” Response options ranged from 1 (*Not at all*) to 5 (*An extreme amount*) and reported internal consistency is .81 (Foti & Hauenstein, 2007).

Data aggregation. The nature of the multilevel data for this study ranges from individual perceptions of the dyad (i.e., PLs and PSGs responding about their co-leader roles) to individual perceptions of the team and team leaders (i.e., subordinate platoon members responding about the platoon and the PL-PSG co-leaders). Therefore, different aggregation techniques were implemented based on participant group and the level of analysis and are described below. Company level ratings are from one source (the CC) and therefore do not need to be aggregated.

Co-leader dyad aggregation. In much of the multilevel research, indices of agreement such as difference scores or indices of interrater agreement are used to justify aggregation of members scores because they suggest the scores are similar enough to aggregate. However, in the current study, the amount of dissimilarity or incongruence between the members of the dyad, as well as their average scores on each measure, were of interest in the analysis. Therefore, it was not of concern if there was low agreement between the dyad members on a specific scale, as this information was accounted for in the moderation analyses. For all dyadic measures, the dyad's average score is important in assessing the quality of interactions and relationship (i.e., higher mean values on communication reflect higher quality communication) and a congruence score was used as additional information as to how much the dyad agrees in regard to these measures. Using both pieces of information allowed for a more detailed comparison between dyads that have the same mean but different levels of agreement on a measure. For example, a mean value of 4 can be attained from a dyad with both scores of 4 or a dyad with scores of a 1 and a 5, demonstrating a meaningful difference between these dyads.

There are a variety of ways in which congruence can be calculated for dyads and Kenny, Kashy, and Cook (2006) suggest the following strategies based on what type of congruence is of interest. Congruence can be assessed based on the level, spread, and shape across items. Similarity in level refers to whether the members of the dyad have similar mean values across a set of items. Spread refers to variability in responses across items and lastly, shape refers to patterns in the distribution of responses across items. Typically, similarity in shape is most important in dyadic analysis because similarity in shape reflects greater similarity on that measure (Kenny et al., 2006).

Various indices of dyadic congruence differentially address similarity or dissimilarity on level, spread, and shape. Kenny et al. (2006) suggest that the most appropriate index for dyadic congruence if patterns in all three components are of interest is a measure of dissimilarity. The measures used in the current study address different interactions or exchanges the dyad encounters throughout their working relationship and each of the measures contains a variety of items reflecting different aspects of that interaction (e.g., a set of decision-making behaviors). Using an index of congruence that takes into consideration differences in response patterns across all items within a measure maximizes the amount of information used to assess how congruent the dyad members are in their interpretation of their work interactions; therefore, all three components of congruence (level, spread, and shape) were of interest. The most common indices of dissimilarity are discrepancy (the sum of absolute differences divided by the number of measures), d^2 (the sum of the squared differences between measures), and distance (the square root of the sum of the squared differences; Kenny et al., 2006). Generally, the authors suggest that distance measures are more desirable because they have a spatial interpretation, and therefore the current study used distance as an aggregate measure of similarity.

It is important to note that these measures of dissimilarity are based on differences between each dyad member's scores. The use of difference scores has been criticized by some in dyadic research (e.g., Cronbach & Furby, 1970; Edward, 1994; Johns, 1981). Issues such as unreliability, correlation with each component score, and issues dealing with the direction of the differences have been identified as potential issues with using difference scores. A popular suggested alternative to difference scores is polynomial

regression and response surface methodology (Edwards, 1994, 2007); however, these methods require larger sample sizes and therefore could not be implemented for the current study. Small sample studies dealing with congruence are limited in ability to overcome these issues by using polynomial regression and response surface methods, and have resorted to using difference scores (e.g., Coyle & Foti, 2015). This is a noted limitation in the current study but the use of difference scores outweighs the alternatives of either a more sophisticated analysis with inadequate power, such as polynomial regression, or disregarding congruence altogether.

Subordinate platoon team-level aggregation. All individual subordinate team member responses were aggregated to the team level using a direct consensus model (Chan, 1998). In order to justify aggregation, three indices of agreement were calculated (see Table 2). Two intraclass correlation coefficients $ICC(1)$ and $ICC(2)$ were calculated to assess the proportion of total variance accounted for by group membership and the reliability of group-level means, respectively. Bliese (2000) suggests that $ICC(1)$ values should be interpreted as effect sizes with .01 considered small, .10 medium, and .25 large (LeBreton & Senter, 2008; Murphy & Myers, 1998). For $ICC(2)$ indices, values above .70 are considered acceptable for aggregation (LeBreton & Senter, 2008; Nunnally, 1978; Nunnally & Bernstein, 1994). Additionally, interrater agreement were calculated using the r_{wg} statistic (James, Demaree, & Wolf, 1984). LeBreton and Senter (2008) suggest that for r_{wg} , values of .51 to .70 are considered moderate agreement, .71 to .90 strong agreement, and .91 to 1.00 very strong agreement. Taken together, the ICC values and the r_{wg} values presented in Table 2 provide adequate justification for aggregating

individual subordinate team member ratings of satisfaction and co-leader effectiveness to the team-level.

Table 2

Statistics for individual-level measures aggregated across teams (for subordinate platoon members)

Measure	<i>N</i> (teams)	# items	<i>M</i> $r_{wg(J)}$	<i>SD</i> $r_{wg(J)}$	<i>ICC</i> (1)	<i>F</i> -value	<i>p</i>	<i>ICC</i> (2)
Team sat	29	7	.54	.42	.258	3.50	.000	.714
Co-Leader Effectiveness	29	7	.89	.16	.182	2.54	.000	.606

Chapter 4: Results

Assumptions

Prior to conducting analyses to test the proposed hypotheses, assumptions for normality, linearity, and homoscedasticity were checked according to best practices as outlined by Tabachnick and Fidell (2013). To start, inspection of the data did not reveal any inaccuracies in data entry. In regard to univariate outliers, three extreme outliers were identified in the individual-level PL/PSG responses and removed. Extreme outliers were identified based on examination of boxplots as well as identifying standardized scores in excess of 3.29 (Tabachnick & Fidell, 2013). Nineteen other individuals were identified as having outlying scores on at least one variable; however, these outliers were not considered extreme and were retained to maintain as large of a sample as possible.

One of these individual extreme outliers was part of a complete dyad and resulted in this dyad having extreme values in the dyadic analysis and was removed, reducing the sample size for complete dyads to 48. For those dyads and individuals that were removed, several of their standardized scores on the dyad-level variables fell almost 5 standard deviations below the group mean. Seven other dyads were identified as having outlying scores on one or more of the dyadic variables but were not considered extreme (standardized scores not in excess of 3.29). These outliers were retained to maintain as large of a sample as possible. All extreme univariate outliers were also identified as multivariate outliers and non-extreme outliers were not considered multivariate outliers. Multivariate outliers were determined by creating a linear combination of the predictors of relationship quality and examining the X^2 p -values ($p < .001$ indicates multivariate outlier) corresponding with the resulting Mahalanobis distance score for each case

(Tabachnick & Fidell, 2013). No extreme outliers were identified in the subordinate platoon member and company-level supervisor datasets.

Before removing the extreme outliers, it is important to determine whether or not these participants can be retained by reducing the influence the extreme scores have on the analyses through methods such as variable transformations (Tabachnick & Fiedell, 2013). Each variable demonstrated a slight negative skew, which was due partially to the extreme outliers. Based on the direction and severity of the skewness (moderately negative), two variable transformation methods, square root and logarithmic, were employed to attempt to reduce the amount by which the outliers deviated from the majority of scores, but were unsuccessful. Although not ideal, cases are typically removed if the outliers are not reduced after variable transformations in order to avoid distortion of the results and violation of assumptions for regression analyses (Tabachnick & Fidell, 2013). After removing extreme outliers, inspection of residual plots did not reveal any violations of the assumptions of normality, linearity, and homoscedasticity, confirming that retention of the non-extreme outliers was acceptable.

In addition to assessing residual plots, several bivariate relationships were investigated further to determine whether any curvilinear relationships were present. Specifically, bivariate relationships between each predictor and co-leader relationship quality were examined, as well between each predictor and the other key outcomes, and lastly, between co-leader relationship quality and the other key outcomes. Exploring non-linear relationships is important for two key reasons. First, it is important in order to accurately model these relationships. If linearity is assumed when a curvilinear relationship exists, model estimation is less accurate. Second, understanding the shape of

these relationships helps gain a better understanding of the relationships between variables in the model.

Examination of possible curvilinear bivariate relationships was carried out in two ways. To start, each bivariate relationship was plotted in a scatterplot to visually assess possible curvilinear effects. Second, each set of two variables was entered into a series of bivariate regressions (e.g., each predictor was independently entered into a bivariate regression as the IV and relationship quality was entered into each as the DV). In each of these regressions the predictor was entered as a linear term and then quadratic and cubic terms were compared to the linear term to determine whether a term capturing possible curvilinear relationships was a better fit for the model. Using this regression technique was an important step in assessing curvilinear relationships as the shape of relationship as depicted in scatterplots can often be difficult to interpret when the relationship between the two variables is small to moderate in effect. None of the scatterplots provided strong evidence for any curvilinear relationships and results from the bivariate regressions confirmed this finding.

Descriptive statistics and covariates

Following all data screening steps, descriptive statistics and bivariate correlations were computed at the individual and dyadic level (see Tables 3-6). Correlations between demographic characteristics (e.g., rank, Army tenure, platoon tenure; see Table 5) were assessed to determine whether any of these demographics need to be controlled for in subsequent analyses. These correlations demonstrated that at the dyad-level of analysis, PSG tenure in the platoon was positively, significantly correlated with goal congruence ($r = .29, p = .043$). Further, at the individual-level of analysis, PL Army tenure was

positively, significantly correlated with role clarity ($r = .35, p = .002$). Therefore, at the dyad-level, all analyses involving goal congruence used PSG platoon tenure as a covariate and all individual-level analyses involving role clarity used Army tenure as a covariate. Although at the individual-level, Army tenure was correlated with variables of interest specifically for PLs, Army tenure for both groups was used in the individual relative weights analysis (described in a subsequent section) for consistency in models across groups. Lastly, for all dyad-level analyses, co-leader time together was used as an additional covariate because of the strong theoretical link between time and development of social relationships.

Table 3
Dyad-level intercorrelations and descriptive statistics

Variables	<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9
1 Co-Leader Time Together	5.93	3.61	48	-								
2 Relationship Quality	5.91	0.59	48	.12	(.91)							
3 Role Clarity	5.80	0.52	48	.06	.53 **	(.87)						
4 Goal Congruence	2.35	1.12	48	.19	.12	-.02	-					
5 Decision-Making	5.97	0.49	48	-.08	.73 **	.47 **	.12	(.80)				
6 Communication	5.87	0.50	48	.01	.63 **	.50 **	.08	.79 **	(.78)			
7 Conflict Management	5.67	0.61	48	.08	.45 **	.48 **	.19	.45 **	.45 **	(.80)		
8 Willingness to Learn	6.24	0.46	47	-.03	.71 **	.49 **	-.01	.60 **	.64 **	.55 **	(.93)	
9 Support	6.10	0.46	48	-.15	.72 **	.53 **	-.07	.66 **	.73 **	.51 **	.79 **	(.93)
10 Co-Leader Effectiveness (CC Rating)	4.05	0.74	30	.12	.31	-.12	.11	.30	.46 **	-.15	.25	.20
11 Co-Leader Effectiveness (Subordinates Rating)	3.57	0.62	28	.09	.18	.13	-.06	.04	.13	.01	.29	.23
12 Team Performance (CC Rating)	5.47	0.82	30	.32 *	.29	.23	-.04	.15	.39 *	.16	.34 *	.34 *
13 Team Satisfaction (Subordinates Rating)	4.57	1.17	28	.37 *	.07	.12	-.08	-.02	-.05	-.05	-.02	.04
14 Team Satisfaction Facet	4.68	1.15	28	.35 *	.04	.11	-.07	-.06	-.09	-.06	-.05	.01
15 Team Viability Facet	4.42	1.22	28	.39 *	.10	.14	-.09	.02	.00	-.03	.02	.08
16 Relationship Quality Congruence	4.81	2.34	48	-.11	-.57 **	-.11	-.26 *	-.40 *	-.29 *	-.37 **	-.40 *	-.34 *

Note. One-tailed test of significance. * $p < .05$; ** $p < .001$. Alpha reliabilities on the diagonal. CC = Company Commander.

Table 3 Continued
Dyad-level intercorrelations and descriptive statistics

Variables		<i>M</i>	<i>SD</i>	<i>N</i>	10	11	12	13	14	15	16				
1	Co-Leader Time Together	5.93	3.61	48											
2	Relationship Quality	5.91	0.59	48											
3	Role Clarity	5.80	0.52	48											
4	Goal Congruence	2.35	1.12	48											
5	Decision-Making	5.97	0.49	48											
6	Communication	5.87	0.50	48											
7	Conflict Management	5.67	0.61	48											
8	Willingness to Learn	6.24	0.46	47											
9	Support	6.10	0.46	48											
10	Co-Leader Effectiveness (CC Rating)	4.05	0.74	30	(.94)										
11	Co-Leader Effectiveness (Subordinates Rating)	3.57	0.62	28	.29	(.95)									
12	Team Performance (CC Rating)	5.47	0.82	30	.69	**	.49	**	-						
13	Team Satisfaction (Subordinates Rating)	4.57	1.17	28	.07		.70	**	.40	*	(.95)				
14	Team Satisfaction Facet	4.68	1.15	28	.06		.71	**	.40	*	.99	**	(.93)		
15	Team Viability Facet	4.42	1.22	28	.08		.68	**	.39	*	.99	**	.97	**	(.85)
16	Relationship Quality Congruence	4.81	2.34	48	.15		.27		.02		.27		.27		-

Note. One-tailed test of significance. **p* < .05; ***p* < .001. Alpha reliabilities on the diagonal. CC = Company Commander.

Table 4
Dyad-level intercorrelations and descriptive statistics (controlling for co-leader time together)

Variables	N ^a	1	2	3	4	5	6	7	8	9
1 Relationship Quality	47	-								
2 Role Clarity	47	.58 **	-							
3 Goal Congruence	47	.00	-.01	-						
4 Decision-Making	47	.72 **	.52 **	.06	-					
5 Communication	47	.61 **	.52 **	.02	.79 **	-				
6 Conflict Management	47	.42 *	.50 **	.14	.44 *	.43 *	-			
7 Learning	47	.72 **	.50 **	.00	.60 **	.64 **	.55 **	-		
8 Support	47	.76 **	.56	-.08	.65 **	.73 **	.52 **	.79 **	-	
9 Co-Leader Effectiveness (CC Rating)	30	.30	-.11	.10	.36 *	.47 *	-.14	.26	.22	-
10 Co-Leader Effectiveness (Subordinates Rating)	28	.18	.14	-.06	.06	.16	.04	.32	.27	.30
11 Team Performance (CC Rating)	30	.29	.27	-.09	.28	.43 *	.19	.38 *	.43 *	.64 *
12 Team Satisfaction (Subordinates Rating)	28	.09	.16	-.07	.09	.05	.07	.06	.16	.11
13 Team Satisfaction Facet	28	.06	.14	-.06	.04	.00	.05	.02	.12	.11
14 Team Viability Facet	28	.12	.18	-.08	.14	.11	.10	.11	.21	.12
15 Relationship Quality Congruence	47	-.47 **	-.20	-.08	-.30 *	-.22	-.35 *	-.40 *	-.36 *	.17

Note. One-tailed test of significance. * $p < .05$; ** $p < .001$. ^a $n = 24$ for correlations between CC ratings and Team ratings because not all teams that were linked to co-leader dyads had ratings from company-level supervisors.

Table 4 Continued
Dyad-level intercorrelations and descriptive statistics (controlling for co-leader time together)

Variables		N ^a	10	11	12	13	14	15
1	Relationship Quality	47						
2	Role Clarity	47						
3	Goal Congruence	47						
4	Decision-Making	47						
5	Communication	47						
6	Conflict Management	47						
7	Learning	47						
8	Support	47						
9	Co-Leader Effectiveness (CC Rating)	30						
10	Co-Leader Effectiveness (Subordinates Rating)	28	-					
11	Team Performance (CC Rating)	30	.69 **	-				
12	Team Satisfaction (Subordinates Rating)	28	.72 **	.41 *	-			
13	Team Satisfaction Facet	28	.72 **	.41 *	.99 **	-		
14	Team Viability Facet	28	.71 **	.40 *	.99 **	.96 **	-	
15	Relationship Quality Congruence	47	.26	.07	.23	.23	.23	-

Note. One-tailed test of significance. **p* < .05; ***p* < .001. ^a*n* = 24 for correlations between CC ratings and Team ratings because not all teams that were linked to co-leader dyads had ratings from company-level supervisors.

Table 5

Bivariate correlations between tenure demographics, co-leader processes, and key outcomes

Variables	<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9
1 PL Army Tenure	43.43	29.30	49	-								
2 PL Company Tenure	14.97	11.06	49	-.02								
3 PL Platoon Tenure	6.84	4.06	49	.11	.03							
4 PSG Army Tenure	165.65	44.84	49	.22	.00	.03	-					
5 PSG Company Tenure	8.43	5.24	49	.18	-.03	.66 **	-.08	-				
6 PSG Platoon Tenure	11.56	6.82	49	-.14	.66 **	.13	-.02	-.10	-			
7 Dyad Time Together	5.89	3.58	49	-.09	.21	.78 **	-.01	.46 **	.43 **	-		
8 Role Clarity	5.77	0.57	49	.04	-.21	.07	-.06	.16	-.06	.09	-	
9 Goal Congruence	2.35	1.11	49	-.12	.09	.06	-.07	.03	.29 *	.19	.00	-
10 Decision-Making	5.92	0.61	49	.05	-.09	-.04	.00	-.04	-.08	-.02	.60 **	.12
11 Communication	5.80	0.67	49	-.04	-.14	.06	-.08	.04	-.12	.06	.62 **	.09
12 Conflict Management	5.64	0.66	49	.07	-.28	.07	.24	-.02	-.01	.10	.57 **	.19
13 Willingness to Learn	6.19	0.57	48	.07	-.17	.03	.02	.03	.00	.02	.62 **	.03
14 Support	6.03	0.65	49	.13	-.15	-.04	.04	-.07	-.10	-.05	.64 **	-.01
15 Relationship Quality	5.87	0.64	49	.06	-.06	.03	.06	.09	.03	.14	.60 **	.13
16 Co-Leader Effectiveness (CC Rating)	4.00	0.77	31	-.12	.00	.10	-.26	.12	-.10	.15	.09	.13
17 Co-Leader Effectiveness (Subordinates Rating)	3.57	0.62	28	-.28	.20	-.13	-.27	.07	.20	.09	.13	-.06
18 Team Performance (CC Rating)	5.45	0.82	31	-.12	-.07	.05	-.27	.07	.04	.34	.27	-.03
19 Team Satisfaction (CC Rating)	4.57	1.17	28	-.13	.24	.09	-.17	.17	.19	.37	.12	-.08

Note. * $p < .05$; ** $p < .001$.

Bivariate correlations between tenure demographics, co-leader processes, and key outcomes

Note. * $p < .05$; ** $p < .001$.

Table 6a
Individual-level intercorrelations and descriptive statistics (for PLs & PSGs)

All PL-PSG Participants		<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9	10	11
1	Army Tenure	107.46	73.51	158	-										
2	Company Tenure	11.96	9.81	158	.34 **	-									
3	Platoon Tenure	9.36	7.37	157	.31 **	.76 **	-								
4	Role Clarity	5.74	0.73	157	.09	.15	.15	-							
5	Goal Congruence	2.38	1.09	96	-.02	.04	.17	.03	-						
6	Decision-Making	5.90	0.77	157	-.02	.01	.04	.50 **	.10	-					
7	Communication	5.83	0.80	157	.00	.01	.08	.50 **	.07	.75 **	-				
8	Conflict Management	5.67	0.74	155	.00	-.13	-.02	.40 **	.11	.47 **	.52 **	-			
9	Willingness to Learn	6.25	0.68	156	-.07	.01	.03	.41 **	.02	.57 **	.62 **	.50 **	-		
10	Support	5.87	0.84	157	-.08	.02	.07	.50 **	.03	.62 **	.64 **	.40 **	.64 **	-	
11	Relationship Quality	5.88	0.82	157	-.09	.03	.04	.46 **	.10	.57 **	.63 **	.48 **	.73 **	.70 **	-

Note. **p* < .05; ***p* < .001.

Table 6b
Individual-level intercorrelations and descriptive statistics (for PLs)

PLs		<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9	10	11
1	Army Tenure	46.34	36.98	76	-										
2	Company Tenure	8.39	6.10	76	.28 *	-									
3	Platoon Tenure	6.84	4.41	75	.14	.72 **	-								
4	Role Clarity	5.68	0.67	75	.35 **	.23 *	.16	-							
5	Goal Congruence	2.27	1.14	48	-.25	.08	.09	.10	-						
6	Decision-Making	5.95	0.75	75	.06	-.09	-.07	.41 **	.11	-					
7	Communication	5.82	0.80	75	.03	-.03	.06	.44 **	.00	.77 **	-				
8	Conflict Management	5.71	0.69	74	.07	.04	.16	.50 **	.14	.42 **	.42 **	-			
9	Willingness to Learn	6.32	0.63	74	.11	.11	.14	.41 **	.06	.51 **	.55 **	.49 **	-		
10	Support	5.98	0.79	75	.07	-.06	.06	.52 **	.08	.60 **	.63 **	.51 **	.57 **	-	
11	Relationship Quality	6.00	0.79	75	.09	-.06	.02	.49 **	.13	.56 **	.62 **	.59 **	.71 **	.65 **	-

Note. **p* < .05; ***p* < .001.

Table 6c
Individual-level intercorrelations and descriptive statistics (for PSGs)

PSGs	<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9	10	11
1 Army Tenure	164.11	49.53	82	-										
2 Company Tenure	15.27	11.36	82	.03	-									
3 Platoon Tenure	11.67	8.70	82	.06	.74 **	-								
4 Role Clarity	5.80	0.78	82	-.13	.09	.12	-							
5 Goal Congruence	2.48	1.03	48	-.10	-.04	.18	-.04	-						
6 Decision-Making	5.85	0.79	82	.06	.10	.12	.58 **	.09	-					
7 Communication	5.84	0.81	82	-.05	.03	.09	.55 **	.12	.73 **	-				
8 Conflict Management	5.64	0.79	81	.06	-.19	-.07	.34 **	.11	.50 **	.61 **	-			
9 Willingness to Learn	6.18	0.71	82	-.04	.02	.04	.43 **	-.02	.61 **	.67 **	.50 **	-		
10 Support	5.78	0.88	82	.00	.11	.14	.52 **	.00	.63 **	.67 **	.32 **	.69 **	-	
11 Relationship Quality	5.77	0.84	82	.00	.15	.12	.46 **	.09	.58 **	.65 **	.39 **	.75 **	.73 **	-

Note. **p* < .05; ***p* < .001.

Tests of hypotheses

Hypotheses 1 and 2

Analyses for the first two hypotheses were conducted at the dyad level and posited that the set of co-leader processes would be positively related to co-leader relationship quality and that the level of dyadic congruence on each of the predictors would moderate the relationship between the predictor and co-leader relationship quality. The first hypothesis was tested using a hierarchical linear multiple regression that included the seven antecedents (i.e., understanding of role expectations, participative decision-making, goal congruence, communication, conflict management, willingness to learning, and support and empowering each other) and two control variables (dyad time together and PSG platoon tenure) as predictors of co-leader relationship quality. Results from this analysis are shown in Table 7.

The control variables were entered into the model at step 1 and did not have a significant effect on co-leader relationship quality ($F(2, 44) = .37, p = .692, R^2 = .02$, 95% CI [-.05, .09]). The co-leader processes were entered into the model at step 2 and resulted in a significant increase in the model R^2 ($F(9, 37) = 11.404, p < .001, R^2 = .74$, 95% CI [.64, .84]); demonstrating that these co-leader processes together significantly predict co-leader relationship quality. However, only dyad time together, decision-making, learning, and support had significant partial effects in the final model (β s = .216, .513, .287, .368, p s = .018, .001, .029, and .017, respectively), partially supporting hypothesis 1.

Examination of bivariate correlations and collinearity diagnostic statistics (i.e., variance proportions greater than .5 and condition indexes above 30; Tabachnick &

Fidell, 2013; Belsey, Kuh, & Welsch, 1980) reveal that the predictors were highly correlated, which can pose problems to interpreting the model. As a result, a follow-up relative weights analysis (RWA; Johnson, 2000), using the web-based tool from Tonidandel and LeBreton (2015) was conducted to determine the relative importance of each predictor, addressing some of the issues associated with multicollinearity (Tonidandel & LeBreton, 2015) and providing additional information on which predictors are the strongest contributors to variance in the outcome.

An RWA provides information on the “proportionate contribution each predictor variable makes to the total predicted criterion variance taking into account a variable’s contribution by itself and in combination with other predictor variables” (Tonidandel & LeBreton, 2015, p. 208; Johnson & LeBreton, 2004). This helps address issues of multicollinearity by creating a set of predictors that are orthogonal to one another (Tonidandel & LeBreton, 2015). Traditional RWA does not allow for a hierarchical approach in order to include covariates in the model; therefore, each predictor and the outcome were regressed on the two covariates, dyad time together and PSG platoon tenure, and the residual values were entered as the predictors and outcome into the RWA model.

Results demonstrated that decision-making, willingness to learn, and support had significant effects in the model (model $R^2 = .72$) and that decision-making had the largest contribution (27.34%), followed closely by support (23.27%) and learning (21.17%; see Table 8 for full results). In both the hierarchical regression and the RWA, the full model was significant but not all predictors had significant partial effects, failing to support this

aspect of hypothesis 1 for role clarity, goal congruence, communication, and conflict management.

Comparing the RWA to the hierarchical regression, the results are consistent with decision-making, learning, and support demonstrating significant partial effects.

Although the coefficient for communication in the first model did not reach significance, it did change signs, showing a negative relationship with relationship quality in the presence of the other predictors. This suppression effect is likely due to issues with collinearity and the RWA unfortunately did not offer much explanation for this, as the weight for communication was not significant. Although the relative weights analysis does help address some of the issues associated with multicollinearity, it does not provide a complete picture or theoretical explanation of why certain predictors may be suppressed by or redundant with others. Additionally, as the coefficients for communication failed to reach significance, this suppression effect should not be interpreted

Table 7

Results of regression analyses for predicting co-leader relationship quality from co-leader interactions (Hypothesis 1).

Variables	Step 1				Step 2				Zero-order corr with DV
	<i>B</i>	<i>SE B</i>	β	sr^2	<i>B</i>	<i>SE B</i>	β	sr^2	
Dyad Time Together	.023	.027	.14	.02	.035	.016	.22 *	.03	.12
PSG Platoon Tenure	-.003	.014	-.04	.00	.001	.009	.01	.00	.02
Role Clarity					.130	.123	.11	.01	.53 **
Goal Congruence					.045	.050	.09	.01	.12
Decision-Making					.619	.176	.51 **	.09	.73 **
Communication					-.292	.192	-.25	.02	.63 **
Conflict Management					-.105	.107	-.11	.01	.45 *
Willingness to Learn					.371	.190	.29 *	.03	.71 **
Support					.477	.216	.37 *	.04	.72 **
Intercept	5.809	.195			-1.779	.786			
R^2	.02 ^a				.74 ^b				
Adjusted R^2	-.03				.67				
R	.13				.86**				
ΔR^2					.72				
F for ΔR^2					14.33**				

Note. ^a95% CI [-0.05, .09]; ^b95% CI [.64, .84]. * $p < .05$, ** $p < .001$. The sample size used for this analysis was 48. One dyad was missing data on "willingness to learn," however, pairwise deletion was used to handle missing data and therefore the df for the F -test ($df = 8, 38$ for full model) is based on the smallest pairwise n from the pairwise correlation.

Table 8

Summary of relative weights analysis for hypothesis 1

Predictor	<i>B</i>	β	RW	CI-L	CI-U	RS-RW (%)
Role Clarity	.13	.11	.0731	-.0303	.1530	10.08
Goal Congruence	.05	.09	.0080	-.0808	.0183	1.10
Decision-Making	.62	.51	.1984	.1094	.2980	27.34
Communication	-.29	-.25	.0879	-.0108	.1203	12.12
Conflict Management	-.11	-.11	.0358	-.0563	.0560	4.93
Willingness to Learn	.37	.29	.1536	.0208	.2405	21.17
Support	.48	.37	.1689	.0537	.2278	23.27

Note. Traditional RWA does not allow for control variables to be entered in a separate step in the analysis; therefore, predictors were individually regressed on dyad time together and PSG platoon tenure, and the residual values were saved and used as predictors in this RWA. *B* and β = unstandardized and standardized regression weight from regression presented in Table 7. RW = raw relative weight, CI-L and CI-U = lower and upper bounds of 95% confidence interval used to test statistical significance of the raw weight. RS-RW = relative weight rescaled as a percentage of predicted variance in the relationship quality attributed to each predictor.

In regard to the moderation analyses posed in the second hypothesis, the current sample was not large enough to include dyadic congruence for each predictor together in a multiple regression model. Therefore, six independent models were run with the dyad's mean score on each predictor, the amount of congruence on that predictor, and the interaction between their mean score and congruence as a moderator. Goal congruence was not included in these analyses as it inherently captures congruence in the way that it is operationalized in this study.

In each model, dyad time together was entered as a covariate at step 1, the mean value on that predictor (e.g., mean value on role clarity) was entered at step 2, and congruence on that predictor (e.g., congruence between co-leaders on role clarity scores) as well as the interaction between mean value and congruence score were entered in step 3 to determine whether congruence provides additional predictive value as a moderator in the models. Results demonstrated that congruence and the interaction between congruence and mean value on each of the predictors did not predict relationship quality above and beyond the mean value for any of the six models, failing to support hypothesis 2. Full results can be found in Tables 9a-9f.

Table 9a
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on role clarity (hypothesis 2a)

	Step 1				Step 2				Step 3				
Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	Zero-order correlation with DV
Dyad Time Together	.020	.024	.12	.02	.015	.021	.09	.01	.019	.021	.12	.01	.12
Role Clarity (Mean)					.597	.145	.52 **	.27	1.190	.449	1.04 *	.11	.53 **
Role Clarity (Congruence)									.663	.489	2.08	.03	-.25 *
Mean*Congruence Interaction									-.113	.087	-1.79	.03	-.15
Intercept	5.788	.166			2.357	.845			-1.193	2.650			
<i>R</i> ²	.02 ^a				.29 ^b				.32 ^c				
Adjusted <i>R</i> ²	-.01				.25				.25				
<i>R</i>	.12				.53*				.56*				
ΔR^2					.27				.03				
<i>F</i> for ΔR^2					16.98**				1.00				

Note. *N* = 48. ^a95% CI [-.06, .10]; ^b95% CI [.09, .49]; ^c95% CI [.13, .51]. **p* < .05, ***p* < .001.

Table 9b
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on participative decision-making (hypothesis 2b)

Variables	Step 1				Step 2				Step 3				Zero-order correlation with DV	
	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²		
Dyad Time Together	.020	.024	.12	.02	.031	.016	.19	.03	.027	.017	.16	.03	.12	
Decision-Making (Mean)					.896	.119	.74	**	.55	.883	.298	.73	*	.09
Decision-Making (Congruence)										-.156	.529	-.32		.00
Mean*Congruence Interaction										.038	.086	.43		.00
Intercept	5.788	.166			.374	.729			.282	1.891				
<i>R</i> ²	.02 ^a				.56 ^b				.58 ^c					
Adjusted <i>R</i> ²	-.01				.54				.54					
<i>R</i>	.12				.75**				.76**					
ΔR^2					.55				.02					
<i>F</i> for ΔR^2					56.56**				.96					

Note. *N* = 48. ^a95% CI [-.06, .10]; ^b95% CI [.39, .73]; ^c95% CI [.42, .74]. **p* < .05, ***p* < .001.

Table 9c
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on communication (hypothesis 2c)

	Step 1				Step 2				Step 3				Zero-order correlation with DV			
Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²				
Dyad Time Together	.020	.024	.12	.02	.019	.019	.12	.01	.010	.019	.06	.00	.12			
Communication (Mean)					.735	.136	.62	**	.39	.252	.260	.21	.01	.63	**	
Communication (Congruence)										-.851	.358	-2.82	*	.07	-.38	*
Mean*Congruence Interaction										.150	.063	2.61	*	.07	-.28	*
Intercept	5.788	.166			1.478	.805			4.329	1.607						
<i>R</i> ²	.02 ^a				.41				.48							
Adjusted <i>R</i> ²	-.01				.38				.43							
<i>R</i>	.12				.64**				.69**							
ΔR^2					.39				.07							
<i>F</i> for ΔR^2					29.42**				2.87							

Note. *N* = 48. ^a95% CI [-.06, .10]; ^b95% CI [.21, .61]; ^c95% CI [.30, .66]. **p* < .05, ***p* < .001.

Table 9d
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on conflict management (hypothesis 2d)

	Step 1				Step 2				Step 3				
Variables	<i>B</i>	<i>SE B</i>	β	sr^2	<i>B</i>	<i>SE B</i>	β	sr^2	<i>B</i>	<i>SE B</i>	β	sr^2	Zero-order correlation with DV
Dyad Time Together	.020	.024	.12	.02	.015	.022	.09	.01	.014	.023	.08	.01	.12
Conflict Management (Mean)					.424	.129	.44 *	.19	.479	.326	.50	.04	.45 **
Conflict Management (Congruence)									.021	.265	.09	.00	-.08
Mean*Congruence Interaction									.003	.046	.06	.00	.05
Intercept	5.788	.166			3.417	.734			2.864	2.001			
R^2	.02 ^a				.21				.23				
Adjusted R^2	-.01				.17				.16				
R	.12				.46*				.48*				
ΔR^2					.19				.02				
F for ΔR^2					10.88*				.55				

Note. $N = 48$. ^a95% CI [-.06, .10]; ^b95% CI [.02, .40]; ^c95% CI [.05, .41]. * $p < .05$, ** $p < .001$.

Table 9e
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on willingness to learn from each other (hypothesis 2e)

	Step 1				Step 2				Step 3				
Variables	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	Zero-order correlation with DV
Dyad Time Together	.020	.024	.12	.02	.024	.017	.15	.02	.024	.017	.14	.02	.12
Willingness to Learn (Mean)					.926	.134	.72 ***	.51	.772	.261	.60 *	.10	.71 ***
Willingness to Learn (Congruence)									-.146	.409	-.39	.00	-.54 ***
Mean*Congruence Interaction									.017	.069	.24	.00	-.48 ***
Intercept	5.788	.166			-.013	.845			1.073	1.685			
<i>R</i> ²	.02 ^a				.53				.54				
Adjusted <i>R</i> ²	-.01				.51				.50				
<i>R</i>	.12				.73**				.73**				
ΔR^2					.51				.01				
<i>F</i> for ΔR^2					48.04**				.45				

Note. *N* = 48. ^a95% CI [-.06, .10]; ^b95% CI [.35, .71]; ^c95% CI [.37, .71]. **p* < .05, ***p* < .001. The sample size used for this analysis was 48. One dyad was missing data on "willingness to learn;" however, the pairwise deletion method was used to handle missing data and therefore the *df* for the *F*-tests are based on the smallest pairwise *N* from the pairwise correlation.

Table 9f
Results of moderation analyses for predicting co-leader relationship quality from mean and dyadic agreement on supporting and empowering each other (hypothesis 2f)

Variables	Step 1				Step 2				Step 3				Zero-order correlation with DV
	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	
Dyad Time Together	.020	.024	.12	.02	.039	.016	.23 *	.11	.036	.017	.22 *	.10	.12
Support (Mean)					.976	.129	.75 ***	.56	.658	.336	.51 *	.08	.72 **
Support (Congruence)									-.494	.480	-1.85	.02	-.26 *
Mean*Congruence Interaction									.079	.077	1.79	.02	-.17
Intercept	5.788	.166			-.275	.806			1.748	2.143			
<i>R</i> ²	.02 ^a				.57				.58				
Adjusted <i>R</i> ²	-.01				.55				.54				
<i>R</i>	.12				.75**				.76**				
ΔR^2					.55				.01				
<i>F</i> for ΔR^2					57.73**				.53				

Note. *N* = 48. ^a95% CI [-.06, .10]; ^b95% CI [.40, .74]; ^c95% CI [.42, .74]. **p* < .05, ***p* < .001.

Hypothesis 3

The third hypothesis was assessed at the individual co-leader level and explored the relative importance of each predictor between the group of PLs and the group of PSGs to determine whether participative decision-making was relatively more important for PSGs in predicting relationship quality. A multi-group relative weights analysis (RWA) was conducted using the web-based tool from Tonidandel and LeBreton (2015). As mentioned above, an RWA provides information on the relative contribution of each predictor to the variance in the outcome. The multi-group component divides the RWA into groups based on a predetermined identifier. In this case, PLs and PSGs were divided into two groups and the relative importance of the predictors for each group was compared to determine whether decision-making contributed more to the variance in relationship quality as perceived by PSGs compared to PLs.

Relative weights analysis is an alternative to other traditional statistics for assessing relative importance of predictors in a regression analysis. Specifically, traditional statistics such as correlations or comparison of regression weights are known to provide misleading information and are inferior to using a relative weights analysis (Tonidandel & LeBreton, 2015). Many of these indices are affected by multicollinearity between the predictors and RWA accounts for possible multicollinearity. RWA is similar to other types of relative importance analysis such as dominance analysis; however, RWA is more useful when the number of predictors exceeds five or six. Johnson and LeBreton (2004) note this shortcoming in dominance analysis, suggesting that the necessary computations for larger numbers of predictors (more than five or six; Lindeman, Merenda, & Gold, 1980) become prohibitive. Therefore, RWA is an

appropriate option for determining relative importance when the predictors are likely correlated and exceed five or six in number.

In order to maximize the sample size for this analysis, data from all participating PLs and PSGs was included, regardless of whether each participant had matched data from their counterpart. The way in which goal congruence was measured in the current study (as actual congruence between dyad members) makes this variable inherently dyadic, and therefore, an RWA that includes goal congruence cannot include participants that are not part of a complete dyad in the dataset. Therefore, two RWAs were run in order to include goal congruence in one model and maximize the sample size, and in turn power, for the other. Running the second RWA with a larger sample size allows us to use all available data on the other six variables and can provide additional evidence for the hypothesis if consistent with the smaller sample RWA.

In order to use all available data from all participating PLs and PSGs, some of the data in this analysis was dependent (i.e., some participants in each group were matched with participants in the other group, and therefore responses are regarding the same relationship) while other data was independent (i.e., some participants in each group were not matched with a participant in the other group). In order to control for possible differential effects for matched and unmatched dyads, a dummy coded variable (e.g., 0 = unmatched dyad, 1 = matched dyad) was included as a control in this analysis.

Additionally, because PL Army Tenure was significantly correlated with role clarity, Army tenure was also used as a control variable in this analysis. Control variables were included in the same manner as in the RWA associated with hypothesis 1, by regressing the predictors and outcome on the control variables and entering the residual values as

predictors and the outcome in the model. For the RWA that includes goal congruence, the variable dummy coded for dependence in the data was not entered as a covariate because all participants in this analysis were members of matched dyads.

Relative weights analysis with goal congruence. Results from the RWA that includes goal congruence ($n = 96$) demonstrated that in the overall model (not comparing groups) role clarity, decision-making, communication, conflict management, willingness to learn, and support had significant partial effects (i.e., significant relative weights; model $R^2 = .63$; see Table 10a). Willingness to learn contributed the most to relationship quality (31.68%), followed by support (22.22%), decision-making (16.16%), communication (12.09%), role clarity (9.17%), and lastly, conflict management (7.74%).

In regards to the group comparisons decision-making did have a larger contribution to relationship quality (23.61%) for PSGs compared to PLs (10.01%) and was higher in the rank ordering of predictor importance for PSGs; however, the absolute value of the relative weight of decision-making quality did not differ significantly between groups. Despite the lack of significance in the difference between the weights for the two groups, the difference in rank patterns across groups showed that decision-making may be relatively more important in predicting relationship quality for PSGs in regards to its rank order. The pattern suggests decision-making is important to both groups, but was placed higher in importance for PGS, supporting hypothesis 3.

Unexpectedly, conflict management contributed significantly more to relationship quality for PLs (16.49%) as compared to PSGs (3.28%), and this difference in the absolute value of the weights across the two groups was significant. The rank order of predictors for PLs was willingness to learn, conflict management, communication,

support, decision-making, and lastly role clarity. The rank order of predictors for PSGs was willingness to learn, support, decision-making, communication, role clarity, and conflict management. Although only the weight for conflict management significantly differed across groups, the overall pattern in rank orderings did differ between PLs and PSGs. However, RWA does not provide a test of significance to determine whether the patterns in rank ordering are significantly different across groups, and therefore, the findings are more descriptive in nature rather than definitive judgments about significant differences.

Relative weights analysis without goal congruence. Alternately, results from the RWA with a larger sample, but not including goal congruence, are not fully consistent with the first RWA (see Table 10b; model $R^2 = .64$). In the full model, all predictors did each significantly contribute to relationship quality but in a slightly different rank order. Both willingness to learn and support both demonstrated the strongest contributions in the full model (31.87% and 24.73%, respectively). However, communication had the next largest contribution (14.99%), followed by decision-making (8.18%), conflict management (8.99%), and lastly, role clarity (8.18%).

In regards to group comparisons, decision-making demonstrated a very similar weights between the two groups (PLs: 10.78% and PSGs: 11.53%), and none of the weights were significantly different across groups. The rank order of predictors for PLs was willingness to learn, support, conflict management, communication, decision-making, and role clarity. The rank order of predictors for PSGs was willingness to learn, support, communication, decision-making, role clarity, and conflict management. The pattern of differences across groups was smaller compared to the first RWA; however,

decision-making did have a slightly higher rank in importance for PSGs, which provides some additional evidence for hypothesis 3. Inconsistencies across these two analyses are addressed in more detail in the discussion.

Table 10a
Summary of individual-level relative weights analysis for hypothesis 3 (with goal congruence included)

Predictor	Groups combined				Platoon Leaders (PLs)		Platoon Sergeants (PSGs)		Test of significant differences in weights across groups	
	RW	CI-L	CI-U	RS-RW (%)	RW	RS-RW (%)	RW	RS-RW (%)	CI-L	CI-U
Role Clarity ^a	.058	.017	.116	9.17	.044	6.57	.075	11.34	-.128	.065
Decision-Making ^a	.102	.047	.177	16.16	.066	10.01	.156	23.61	-.207	.029
Goal Congruence	.006	-.011	.088	0.94	.006	0.93	.007	1.05	-.066	.048
Communication ^a	.076	.035	.126	12.09	.101	15.21	.068	10.31	-.043	.129
Conflict Management ^{a,b}	.049	.007	.111	7.74	.109	16.49	.022	3.28	.016	.192
Willingness to Learn ^a	.200	.108	.326	31.68	.231	34.77	.176	26.59	-.157	.251
Support ^a	.140	.068	.230	22.22	.106	16.02	.158	23.82	-.209	.071

Note. *N* = 96. Traditional RWA does not allow for control variables to be entered in a separate step in the analysis; therefore, predictors were individually regressed on Army Tenure and the residual values were saved and used as predictors in this RWA. Goal congruence scores are only available for individuals part of a full dyad and therefore, the sample size is smaller for this RWA compared to the RWA in Table 10b. RW = raw relative weight, CI-L and CI-U = lower and upper bounds of 95% confidence interval used to test statistical significance of the raw weight. RS-RW = relative weight rescaled as a percentage of predicted variance in the relationship quality attributed to each predictor. ^a = weight is significant in predicting relationship quality; ^b = weight is significantly different across groups. Model *R*² = .63.

Table 10b
Summary of individual-level relative weights analysis for hypothesis 3 (without goal congruence included)

Predictor	Groups combined				Platoon Leaders (PLs)		Platoon Sergeants (PSGs)		Test of significant differences in weights across groups	
	RW	CI-L	CI-U	RS-RW (%)	RW	RS-RW (%)	RW	RS-RW (%)	CI-L	CI-U
Role Clarity ^a	.052	.020	.097	8.18	.061	9.34	.047	7.15	-.054	.098
Decision-Making ^a	.072	.033	.119	11.23	.070	10.78	.075	11.53	-.088	.083
Communication ^a	.096	.061	.137	14.99	.100	15.32	.101	15.48	-.073	.077
Conflict Management ^a	.058	.021	.108	8.99	.104	15.91	.036	5.55	-.010	.151
Willingness to Learn ^a	.205	.137	.286	31.87	.197	30.27	.208	31.91	-.153	.136
Support ^a	.159	.106	.221	24.73	.120	18.39	.185	28.39	-.183	.034

Note. *N* = 158. Traditional RWA does not allow for control variables to be entered in a separate step in the analysis; therefore, predictors were individually regressed on a dummy coded variable for whether each individual was paired with an individual in the opposite group (i.e., part of a complete dyad), as well as Army Tenure, and the residual values were saved and used as predictors in this RWA. RW = raw relative weight, CI-L and CI-U = lower and upper bounds of 95% confidence interval used to test statistical significance of the raw weight. RS-RW = relative weight rescaled as a percentage of predicted variance in the relationship quality attributed to each predictor. ^a = weight is significant in predicting relationship quality; ^b = weight is significantly different across groups. Model *R*² = .64.

Hypotheses 4-8

Due to a relatively small sample, the last four hypotheses relating co-leader relationship quality to co-leader effectiveness, and both variables to team outcomes, were assessed by examining the partial correlations between constructs. Partial correlations were used in assessing these bivariate relationships in order to include dyad time together as a control variable. Although dyad time together does not have a significant bivariate correlation with the variables of interest, it has a strong theoretical link to development of social relationships and the outcomes of these relationships and was therefore deemed a necessary control. None of the tenure variables (i.e., Army, company, platoon tenure) were significantly related to the variables in these analyses and were, therefore, not included as additional covariates.

Hypothesis 4 predicted that co-leader relationship quality would be positively related to co-leader effectiveness (see Table 3 for bivariate correlations and Table 4 for partial correlations controlling for dyad time together). Relationship quality was not significantly correlated with effectiveness as rated by either superiors or subordinates both when including and excluding dyad time together as a control ($r_s = .30$ and $.31$, $p_s = .055$ and $.050$, respectively), failing to support hypothesis 4. Although these correlations did not reach significance at the $p < .05$ level, they did reach significance at the $p < .10$ level.

Hypothesis 5 predicted that each co-leader process (a. understanding of role expectations, b. participative decision-making, c. goal congruence, d. communication, e. conflict management, f. attitudes towards learning, and g. support and empowering each other; see Tables 3 and 4) would be independently and positively related to co-leader

effectiveness. Only decision-making and communication were significantly correlated with co-leader effectiveness when controlling for dyad time together. No other predictors had significant bivariate or partial correlations with effectiveness. Decision-making and communication were significantly related to effectiveness as rated by company-level supervisors ($r_s = .36$ and $.47$, $p_s = .029$ and $.005$, respectively), but not as rated by subordinates, partially supporting hypothesis 5.

Hypothesis 6 predicted that co-leader effectiveness would be positively related to team effectiveness (see Tables 3 and 4). Team effectiveness was measured as supervisor ratings of performance as well as team satisfaction. Co-leader effectiveness as rated by supervisors was significantly, positively related to team performance ($r = .64$, $p = .001$). Co-leader effectiveness as rated by subordinates was significantly, positively related to supervisor ratings of team performance ($r = .49$, $p = .009$) as well as team satisfaction ($r = .69$, $p < .001$), supporting hypothesis 6. Surprisingly, effectiveness ratings from supervisors and subordinates were not significantly correlated with each other.

Hypothesis 7 predicted co-leader relationship quality would be positively related to team effectiveness (see Tables 3 and 4). Relationship quality was not significantly correlated with team performance nor team satisfaction, both with and without controlling for dyad time together, failing to support this hypothesis.

Lastly, hypothesis 8 predicted each co-leader process (a. understanding of role expectations, b. participative decision-making, c. goal congruence, d. communication, e. conflict management, f. attitudes towards learning, and g. support and empowering each other; see Tables 3 and 4) would be positively related to team effectiveness. Team performance was significantly correlated with communication ($r = .43$, $p = .010$),

willingness to learn ($r = .38, p = .020$), and support ($r = .43, p = .010$). Alternately, team satisfaction was not significantly related to any co-leader processes, both with and without controlling for dyad time together, failing to support this hypothesis.

Post hoc analyses

Congruence in views of the co-leader relationship

An additional set of analyses were conducted to explore another key component of co-leader relationship quality that was not originally modelled due to the small sample size. Specifically, congruence in perceptions of the quality of the relationship (i.e., both members view the relationship as good or bad) were explored to determine how congruence in how each leader views their relationship with their counterpart relates to the other key variables in the model. Congruence was calculated in the same manner in which it was calculated for each of the predictor variables (i.e., Euclidean distance across scale items) and bivariate correlations were calculated between relationship quality congruence and all other variables in the model (see Table 3). Results demonstrated that agreement in perceptions of the relationship quality were related to the mean value of relationship quality ($r = -.57, p < .001$), as well as to goal congruence ($r = -.26, p = .037$), participative decision-making ($r = -.40, p = .003$), communication ($r = -.29, p = .023$), conflict management ($r = -.37, p = .005$), willingness to learn from each other ($r = -.40, p = .003$), and support ($r = -.34, p = .010$). Note that low distance scores reflect higher levels of agreement across constructs, therefore the correlations with each variable are negative.

Supplementary quotes

In addition to providing quantitative data, the Soldiers responded to open-ended questions such as “what impacts the quality of the relationship between you and your counterpart?” and “how does your relationship with your counterpart impact your platoon?”. They were also asked to “provide specific experiences that stand out that have been negative in your relationship.” These qualitative responses were not part of the formal hypothesis testing but did provide supplementary support for many of the findings, as well as support for some of the theoretical arguments underlying the model put forth, despite the lack of significant quantitative findings on these aspects.

For example, although communication did not have significant partial effects in all of the models presented above, many participants noted its impact on their relationship. One Soldier said he has a good relationship with his counterpart because “[they] have open communication and [his counterpart] always considers [his] point of view.” Others noted, “open communication is the most impactful variable that sways the quality of relationship between myself and my counterpart. The more open communication available and on-going, the better the relationship,” and “we listen to each other’s opinions and we don’t step over each other, we have a really good communication.” For some Soldiers, communication was key in overcoming some of the challenges co-leaders face, such as differences in rank and background experiences. One Soldier shared,

We don’t let rank or position deter open communication. We both communicate ideas and create solutions together based on our past experiences. Biggest impact is that we listen to each other and support each other, have genuine care for our success and team's success.

This quotation reveals that communication not only helps overcome personal differences but is also key in expressing support and care for each other and their team, important themes that occurred throughout Soldier experiences as well as was supported in the quantitative analyses.

Additionally, despite the lack of significant quantitative findings in relation to goal congruence and agreement on the other six predictors, many participants noted the importance “similar work-related goals,” and of being “on the same page. Even when [they] don’t agree [they] come up with a mutual decision.” One participant suggested that he and his counterpart, “work well together,” because they are “always working [toward] a common goal that benefits the platoon, not individuals.” Congruence in goals and co-leader team processes was one of the most salient themes in the qualitative data, suggesting that the quantitative analysis did not fully capture these aspects of the co-leader relationship. This finding will be explored in more depth in the discussion.

In addition to providing evidence for theoretical arguments that may have not been well-supported in the quantitative findings, many of the Soldier’s quotes were very much in line with the quantitative findings. Specifically, decision-making, willingness to learn, and support for each other were very strong predictors in the quantitative analyses and many Soldiers noted the importance of these processes in their personal experiences. For example, one participant shared, “if my PSG isn't willing to include me in decisions or taskings, then I'm less willing to work hand in hand with him.” Further, in response to the prompt to provide specific negative experiences in the co-leader relationship, many Soldiers wrote about decision-making. For example one Soldier wrote that his counterpart “[always tries] to make [decisions] without [him] and ha[s] [the] platoon

doin' stuff that they [don't] need to be doing,” and another shared, “at the beginning of my PL time, my PSG tended to make decisions without my input.” Further, participants noted that they don't need to have the same thoughts and ideas, but “even when [they] don't agree [they] come up with a mutual decision.”

Many participants noted the importance of openness to ideas and willingness to learn from each other. Some participants suggested that “willingness to listen to others' ideas, openness to doing tasks a different way and try new things,” and alternately, “unwillingness to consider other ideas/options” as having an impact on their relationship. One Soldier specifically expressed that his counterpart's “level of tactical and technical knowledge” is beneficial to their relationship because “he has a vast amount of knowledge from schools and prior experience, while I still have a lot to learn,” demonstrating that he values the knowledge his counterpart brings to the partnership and has a positive attitude towards learning from him. In regard to supporting each other, participants shared negative experiences such as “my counterpart mostly does not treat me as a peer, but instead a subordinate. This causes the most friction...” while others had positive experiences of support such as “having a mutual understanding that we can come to each other about any problem/issues that we are having.”

The Soldiers also shared their thoughts on how the PL-PSG co-leader relationship impacts the platoon. These experiences and responses supplement the quantitative findings by providing evidence for a missing aspect of the model that was theoretically implied, but possibly not captured in the data. Specifically, the quantitative analysis revealed that the co-leader relationship was not significantly correlated with ratings of co-leader effectiveness nor team effectiveness. The theories used to support these

hypotheses (e.g., social learning theory; Bandura, 1977) suggest that positive and negative aspects of the relationship can trickle down to the subordinate team and are related to key leadership and team outcomes through modelling.

The experiences participants shared support this idea. For example, Soldiers wrote that their subordinates, “strive to be like us,” “see us work well together and want to emulate,” and “see everything about our relationship. If we play mommy/daddy games the platoon would fall apart. Joe is always watching.” Further, one Soldier noted, “our positive relationship/us showing that we are a team trickles down to soldiers and makes them more positive [and] less disgruntled.” In addition to modelling the behaviors of the leaders, participants noted the importance of presenting consistent information and “present[ing] a coherent front.” Another soldier elaborated on a similar thought and wrote, “overall, we have a good working relationship, which helps our platoon get directions and understand why we are doing what we are doing.”

Alternately, some participants suggested that their relationship “rarely” impacts their subordinates because “[they] don’t let disagreements leave the office.” Similarly, many participants simply noted “[it] does not” or “none,” suggesting either those participants are unaware of how their actions and behaviors impact others or, as the first quote suggests, that the co-leader’s know the amount of influence they have on their subordinates and make a conscious effort to hide the negative aspects of their relationship from their team by striving to effectively lead regardless of issues between them and their counterpart. These quotes suggest that the key link between relationship quality and team outcomes is modelling, as implied in theory development, but not directly measured with the quantitative data. This suggests that subordinate views and perceptions of the co-

leaders relationship plays a key role in how the relationship impacts the team, an idea that will be discussed further in the discussion section.

Chapter 5: Discussion

Overall, these results contribute to our understanding of co-leadership by demonstrating that several of the proposed co-leader processes do impact relationship quality and key dyadic and team outcomes. The findings reveal that participative decision-making, willingness to learn, and support stood out as the factors most consistently related to dyadic and team outcomes across analyses. All processes (with the exception of goal congruence) were related to key outcomes in some manner; although the results were not consistent across subsamples and analyses. Despite the differences across analyses, these findings provide preliminary evidence that the current model includes important processes in which the co-leaders engage. Interestingly, the relative importance of the processes in predicting relationship quality demonstrated different patterns for PLs and PSGs, supporting the idea that co-leaders may have different perspectives on the relationship. This is an important contribution to our understanding of the co-leadership process because it suggests that we cannot assume the antecedents of relationship quality or other dyadic outcomes are the same across both leaders.

In addition to contributing to our understanding of the antecedents of co-leader relationship quality, the results also support the argument that co-leadership effectiveness is related to team effectiveness. The current body of literature remains divided on whether co-leadership can work and whether it should be implemented at all. Some of the literature goes as far as to definitively state that co-leadership *cannot* work (e.g., Hackman, 2002; Mintzberg, 1989; Zillman, 2014). The results of the current study illustrate that co-leadership *can* work and provide a preliminary view of what impacts co-leaders' ability to work well together and why some may or may not be successful.

Further detail and explanation of these findings is presented below as well as practical implications and avenues for future research.

In depth review of the findings

Co-leader processes and key outcomes

Predicting relationship quality. The hypotheses surrounding co-leader processes predicting key dyad- and team-level outcomes were partially supported. As noted, hypothesis 1 was partially supported as the full model was significant, but not all co-leader processes had significant partial effects. Most of the predictors (with the exception of goal congruence) have significant, moderate to large bivariate correlations with the outcome, relationship quality, as well as with each other (some as high as .79), suggesting the possibility of multicollinearity issues. The subsequent RWA was informative because it confirmed the findings from the hierarchical regression while accounting for multicollinearity. The results of the RWA confirmed that participative decision-making, willingness to learn, and support were the only three predictors to account for a significant amount of the variance in co-leader relationship quality at the dyadic level.

Interestingly, dyad time together was not significantly correlated with relationship quality until entered into the model with the other seven predictors. This suggests that the other predictors suppress variance in dyad time together that is irrelevant to the prediction of relationship quality, and in turn enhance its predictive ability in the model (Smith, Ager, & Williams, 1992; Tabachnick & Fidell, 2013). As there are several predictors in the model, it is a challenge to know which variable(s) is acting as the suppressor. In addition to dyad time together becoming significant in the model, the

signs for communication and conflict management switched from positively related to relationship quality to negative in the presence of the other predictors. This also may happen in the presence of suppression; however, these coefficients failed to reach significance, and therefore, should not be interpreted. Despite the difficulty in statistically (and theoretically) identifying which predictor is the suppressor, the findings regarding dyad time together help us to better understand the antecedents of relationship quality by demonstrating that time does impact the relationship, a finding that would have been masked by simply examining its bivariate correlation with key outcomes. This highlights the importance of incorporating time into the model in future research and will be discussed more in a subsequent section.

In regard to understanding why willingness to learn, support, and participative decision-making play a larger role in relationship quality, one possible explanation is that these variables are more relationship oriented, and less task oriented. In other words, these three predictors may more strongly link to the assessment of psychological costs and benefits that goes into judgments of relationship quality. Examples of psychological costs are emotional energy and unreturned investments into the relationship, while benefits refer to help and support, psychological gratification, and positive attitudes about oneself (Eby, Durley, Evans, and Ragins, 2008; Levinger, 1983, 1999; Rusbult, 1983; Thibaut & Kelley, 1959). These three predictors may be more likely to convey the message to each individual member “I see your value and I support you,” psychological benefits that may outweigh other factors that play a role in making judgments about relationship quality.

More specifically, as described in the theoretical development of the model, participative decision-making places a particular emphasis on both members as equals in the process (Dionne, Savanna, Hao, & Bush, 2010). Similarly, willingness to learn from each other signifies that each person has value to the other person in the relationship. Unsurprisingly, demonstrating support for and empowering each other likewise provides feelings of self-worth in addition to providing social support in buffering against negative situations. Together, these three predictors may contribute more to psychological feelings of gratification and positive attitudes about oneself compared to the other predictors in the model and are therefore, viewed as stronger benefits in the social exchange relationship.

Alternately, the other four predictors (role clarity, goal congruence, communication, and conflict management) may not directly, or as strongly provide these key psychological benefits. Understanding one's own role, their counterpart's role, and how their roles work together likely make working together more pleasant – as it decreases negative interactions and increases clarity around roles and responsibilities – but this may not be enough to contribute significantly to a high-quality social exchange, in the presence of stronger predictors. Similarly high-quality communication and effective conflict management may have a strong impact on work processes and satisfaction with one's counterpart, but again, may not predict positive relationships above and beyond the more psychologically gratifying predictors. It is likely that if a person feels valued (as indicated by the other three predictors) they can overcome issues working together such as communication issues, poor conflict management, and role clarity without having as large of a negative impact on their relationship.

In regard to goal congruence, the way in which this variable was measured may have been flawed and therefore did not allow the data to reveal much about the role of goal congruence. This issue will be discussed further in a subsequent section dedicated to this issue as goal congruence was not related to any variables in the model. Lastly, the findings from the dyad level analysis can be contrasted with findings predicting relationship quality from the individual-level analysis in which all predictors (except goal congruence) had significant partial effects. It is likely that because the partial effects of the predictors that were not significant at the dyad level are smaller than those that were significant, that the increased sample sizes ($ns = 96$ and 158) at the individual-level provided more power to detect significance.

The explanation of why agreement (i.e., congruence) on these predictors did not moderate the relationship between the mean value on each predictor and relationship quality is likely methodological, rather than theoretical. The theoretical evidence that congruence in attitudes, behaviors, and values is a key predictor of relationship quality (e.g., Byrne, 1971; Harrison, Price, & Bell, 1998) and many other outcomes of social exchange relationships, has been well-founded in the broader social psychological literature, as well as the leader-member exchange, team-member exchange, and team process literatures (e.g., Druskat & Pescosolido, 2002; Klimoski & Mohammed, 1994; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005; Paglis & Green, 2002; Weick & Roberts, 1993). It is therefore, more likely that the current operationalization was flawed, as opposed to findings that contradict well-established theory.

The current study used Euclidean distance scores across items in each scale to represent congruence in level, shape, and spread of responses across predictors. It is well known in the dyadic research that distance scores have limitations, which may contribute to the lack of significant findings. As mentioned in an earlier section, issues such as unreliability, correlation with each component score, and issues dealing with the direction of the differences have been widely noted (e.g., Cronbach & Furby, 1970; Edward, 1994; Johns, 1981). Despite awareness of these issues, the current sample size did not allow for use of alternative methods, such as polynomial regression and response surface methodologies (Edwards, 1994, 2007). As such, the lack of significant findings regarding congruence should not be interpreted to indicate that congruence is unimportant in predicting key co-leader outcomes.

Given the difficulty of obtaining a large enough sample of co-leaders to use these more sophisticated methods, future research should think critically about how to address issues of congruence in the planning of studies on co-leadership. One alternative option to assessing actual congruence is to measure perceptions of congruence. Harrison et al. (1998) suggest that perception of similarity is one of the strongest predictors of attraction and friendship. Although this may not capture actual discrepancies in attitudes and behaviors of how the co-leaders should and do work together, perceptions of congruence may more strongly relate to perceptions of relationship quality while actual congruence may more strongly relate to congruent team process behaviors, and in turn more objective team outcomes. For example, Resick, Dickson, Mitchelson, Allison, and Clark (2010) found that member *perceptions* of how well the team coordinates was positively related to team viability, a subjective attitudinal outcome, while mental model *accuracy* was not.

Lim and Klein (2006) similarly argue that individual team members have their own perceptions of the reality within the team, but the *actual accuracy* of these perceptions is related to objective team performance. Additionally, research on goal congruence suggests that *perceived* goal congruence differentially (and possibly more strongly) predicts team outcomes compared to *actual* goal congruence (e.g., Kristof-Brown & Stevens, 2001), a finding that is discussed more in a subsequent section on goal congruence. These findings suggest that perceptions of congruence and actual congruence may predict different dyad and team outcomes, and both should be carefully considered in future research.

Relative importance of the predictors. It was hypothesized that for the importance of each of the co-leader processes in perceptions of relationship quality, participative decision-making would rank higher for PSGs compared to PLs. Findings from the multigroup RWAs provide preliminary evidence to tentatively support this hypothesis. However, due to low sample size on the goal congruence variable, two RWAs were conducted, with and without goal congruence and results differed slightly across each.

These differences are most likely due to differences in sample size, and the sample itself. Fewer participants were used in the RWA including goal congruence and therefore the samples were different in size. Based on the non-significance of goal congruence across analyses, it is likely that the model excluding goal congruence (which was not significant) that used a larger sample is more accurate. However, these differences suggest that results should be interpreted with caution as these discrepancies may be indicative of unstable weights. Regardless of the small differences across both

RWAs, the findings regarding the relative rank of decision-making was consistent. In both RWAs, the raw weight of decision-making did not significantly differ across groups (i.e., the amount of variance it contributed to co-leader relationship quality was not significantly different across groups); however, when assessing the rank order of predictors within each group, participative decision-making held a higher rank within predictors for PSGs.

Participative decision-making was not the *most* important predictor, but it is important to note that it showed different patterns in importance across groups. This is a key finding for several reasons. To start, the full proposed model – as well as much of the current research on co-leadership – assumes that the focal variables operate in the same way across dyad members. Although decision-making was a significant predictor for both groups, the difference in patterns in relative rank indicates that members of the co-leader pair may view the relationship (and its antecedents) differently, suggesting that differences in experience, roles, and other demographics may impact development of the relationship differently across dyad members.

This is particularly important when considering possible interventions or training and development for co-leaders. Specifically, if co-leaders were to be trained on how to develop a strong working relationship with each other, it is imperative that the leaders consider what may be most important to their counterpart as it may be different from their own attitudes. In the Army context, PLs have the formal, final decision-making authority within the dyad because they hold the higher rank, and thus may not put as much weight into being “included” in the decisions as their counterparts. Given this difference in decision-making power co-leaders with more decision-making power may

benefit from an increased understanding of how their counterpart views this process. This increased awareness may in turn help improve the relationship. In broader co-leadership contexts, there may not be clear, discrete groups with common attributes from which to compare attitudes; however, it is still important to understand that each dyad member may hold different needs that contribute to different views of the working relationship.

Although not specifically hypothesized, this analysis revealed that the relative importance of the other co-leader processes also differed in rank for each group. Willingness to learn held the top rank for both groups, while conflict management was next for PLs and support for PSGs. Another notable finding was that not only was conflict management ranked higher in relative importance for PLs, but this raw weight was also the only one to differ significantly in absolute value across the groups in the RWA with a smaller sample. One possible explanation for this finding is that newer leaders may have less experience with interpersonal conflict and therefore may be more sensitive to the discomfort of conflict with their counterparts. In this case, the leader with less experience with conflict may place a stronger weight on how conflict management impacts their relationship. However, this finding was not consistent across RWAs, and the RWA with fewer predictors and a larger sample (and thus, more power) did not confirm this finding, and thus it should be interpreted with caution.

Overall, the most consistent finding across groups in the individual-level RWA was that all predictors (except goal congruence) significantly contributed to the variance in relationship quality. As mentioned, this was slightly different from the dyad-level RWA presented in hypothesis 1, which suggested that willingness to learn, participative

decision-making, and support were the only predictors to have partial effects in the model. In addition to increased power in the individual-level analyses, there may also be differences in relative contribution of variance to the outcomes at different levels of analysis. Further, commonalities and overlap within the predictors may contribute to differential findings across regressions and samples. This finding highlights that the predictors that were not significant in the dyad-level models may still play a role in predicting co-leader relationship quality, and should not be immediately discarded from future explorations.

More broadly, both the individual- and dyad-level RWAs contribute to our understanding of co-leader relationships by providing preliminary evidence of possible differences across groups. Much of the research on plural leadership assumes that groups of leaders are similar and have common goals and direction, but some of the differences in patterns of relative importance across the groups in these analyses suggests this may not always be the case. This is a noted limitation in the current research on plural leadership, and some literature has suggested that future research account for differences in views, attitudes, goals, and actions within groups of leaders (e.g., Denis et al. 2011), as these dissimilarities may have different effects on how each leader views the leadership team, as well as on their followers.

Predicting co-leader effectiveness. It was next hypothesized that each of the co-leader process would be positively, directly related to co-leader effectiveness in addition to relationship quality. Results demonstrated that only communication and participative decision-making had significant correlations with supervisor ratings of co-leader effectiveness, but not subordinate ratings. Several of the correlations were close to

significance ranging from .18-.32, suggesting again, an issue of power to detect smaller effects with the current sample. Although not much larger, the sample of company supervisors linked with complete dyads was slightly larger than the number of teams linked with complete dyads ($ns = 30$ and 28 , respectively), and only 24 of these dyads had both supervisor and subordinate ratings. Given that the sample sizes were small and differed slightly across these rating sources, differences in results across these rating groups should be interpreted with caution.

In terms of which co-leader interactions reached significance, it is possible that when rating the co-leaders, the company-level supervisors reflected on the positive team processes in which they see the co-leaders engage. For example, communication and decision-making are highly visible processes, compared to others such as attitudes and behaviors towards learning from each other or interpersonal support, which may occur more privately and with fewer outward behaviors between the dyad members. Supervisors likely view the co-leaders communicating and making decisions with each other daily, providing more visible behaviors from which to draw conclusions about the dyad. Additionally, the participative decision-making process may be reflected in visible, high-quality decisions. Specifically, research suggests that in some contexts, participative decision-making can result in higher-quality decisions because this style draws upon multiple individuals with diverse experiences, creating broader knowledge to contribute to the process (Larrick, 2016). If the dyad engages in higher levels of participative decision-making behaviors, and in turn makes visible, higher quality decisions, their supervisors may be more likely to rate them as effective co-leaders,

creating a stronger link between this process and effectiveness in comparison to other processes.

Predicting team effectiveness. Lastly, it was also predicted that the co-leader processes would be positively related to team effectiveness through better coordinated direction and modelling of effective processes to subordinates; results partially supported this assertion. Communication, willingness to learn, and support were the only predictors to be significantly related to supervisor ratings of team performance, and none were related to team satisfaction. In general, these predictors fall into the group of factors that generally demonstrated larger effects throughout all the analyses compared to the other predictors. Role clarity, decision-making, and conflict management had slightly smaller effects (.27, .28, .and .19, respectively) suggesting that power may be an issue with this hypothesis as well.

Overall, team satisfaction was not significantly related to many of the other variables in the model, only demonstrating significant correlations with team performance and co-leader effectiveness. It was originally hypothesized that effective co-leader team processes and a high-quality co-leader relationship would be modelled to subordinate team members and that in turn, subordinate members would engage in these behaviors themselves, leading to performance and satisfaction. It is possible that the impact of modelling these behaviors from co-leaders to their subordinates does not have as strong of a direct effect as hypothesized for several reasons. An assumption that is made here is that the co-leaders not only engage in these teamwork behaviors themselves, but also that their subordinates witness these behaviors and in turn learn from them. If

the co-leader processes are not regularly visible to their subordinates, the key mechanisms through which social learning occurs are not operating.

Additionally, there may be unmodelled variables that influence team satisfaction more strongly than the interleader behaviors in this model. Specifically, much of the groups and teams literature suggests that there are key emergent states that are strongly tied to team member attitudes (e.g., Jehn, Greer, Levine, & Szulanski, 2008; Mathieu et al., 2017; Tekleab et al., 2009), such as cohesion, trust, and conflict. The current study purposefully omitted various team emergent states for parsimony in the relatively large model; however, future research should explore how these dyad-level factors relate to various team outcomes outside of effectiveness, such as cohesion and trust, as these may be key mediators or moderators between co-leader behaviors and team outcomes.

Co-leader relationship quality and key outcomes

Predicting co-leader effectiveness. Hypothesis 4 posited that relationship quality would be positively related to co-leader effectiveness, but results did not support this finding at the .05 level (but did at the .10 level). This hypothesis may have not been supported for both statistical and theoretical reasons. Statistically, there may have not been enough power to detect these smaller effects. The correlations between co-leader relationship quality and ratings of effectiveness by supervisors and subordinates was .30 and .18, with power of 50% and 24%, respectively. This suggests that with a larger sample, these correlations may have reached significance.

Alternately, there may be theoretical reasons why these effects were small and did not reach significance. The first assumption that is made in predicting co-leader effectiveness is that superiors and subordinates have an accurate view of how the co-

leader pair operates together, which may not be true. The co-leaders may take actions to manage the impression they give off regarding their relationship and how well they work together in order to put forth a united front, regardless of their issues. Many of the supplemental qualitative responses support this assertion, as many of the co-leaders suggested that they are aware of the impact the outward appearance of their relationship can have on their subordinate team members. Participants noted that the team looks to the PL and PSG to model effective behaviors and that co-leaders often mask their conflict. One of the key reasons co-leaders in the Army may mask the true nature of their relationship is to try and effectively lead the team regardless of their personal issues. Some co-leaders may be able to overcome their issues, put forth a united front, and be perceived as effective together despite a poor interpersonal relationship.

Alternately, it is possible that co-leaders may have a high-quality interpersonal relationship but may be lacking in the necessary leadership skills to effectively co-lead. The current model attempts to predict relationship quality from high quality work-related interactions rather than personality or other individual characteristics. However, much of the early literature on relationship quality suggests that other factors such as perceptions of similarity between individuals are strong indicators of liking and relationship quality (e.g., the similarity-attraction paradigm; Byrne, 1971). This suggests that co-leaders may develop positive relationships with each other despite lacking important teamwork and leadership competencies, ultimately attenuating the link between relationship-quality and the ability to effectively lead together.

Further, the Army context in which the co-leaders operate allows the PSG to be more visible day-to-day to the team. The PSG is responsible for daily tasks and training,

while the PL focuses more on long-term strategy and ensures the platoons tasks and goals align with goals cascaded down from the company and battalion leaders. If the PL is less visible day-to-day and the PSG does not express dissatisfaction with his counterpart, the subordinates may be unaware of the true nature of the relationship, and therefore judgments of effectiveness may be made with little knowledge of how the co-leader pair truly interacts together. Alternately, the company-level supervisor likely spends more time with the co-leaders together to ensure the platoons they oversee are functioning well and remain aligned with company goals. The correlation between relationship quality and effectiveness as rated by the supervisor is slightly higher, providing preliminary evidence for this argument. Future research should assess superior and subordinate perceptions of how the co-leaders work together and consider how visible each leader is to the team, as well as how visible inner workings of the co-leadership team are.

Predicting team effectiveness. Similar to predicting co-leader effectiveness, relationship quality was not positively related to team effectiveness and the observed effects were small. The correlations between relationship quality and supervisor ratings of performance and team satisfaction were .29 and .09, and associated power with these effects was 47% and 12%, respectively.

A possible explanation for lack of significant findings other than low power is the omission of important situational boundary conditions. Specifically, the team process literature notes the importance of taking the broader context in which the team operates, such as task characteristics, into consideration when assessing team processes and performance (e.g., Mathieu et al., 2017), a suggestion that can be applied to assessing co-leader team processes and outcomes. Boundary conditions such as task characteristics

(e.g., interdependence or criticality) and the context in which the team operates often create stronger or weaker situations in which team behaviors are more or less guided by the task and may have a differential impact on team outcomes.

For example, tasks in the Army are often critical, interdependent, and are high-risk with potentially dangerous consequences of failure. As such, the co-leaders may work to overcome their differences in order to perform and accomplish high-risk tasks and keep their platoon safe. In these cases, the team performance ratings may not be strongly associated with co-leader relationship quality. The small effect that is present may be indicative of how well the leaders are able to overcome their differences. For example, co-leaders with a very poor relationship may only be able to overcome issues in their working relationship to a certain extent. In non-military, or other high-risk contexts, it may be less critical for co-leaders to overcome their issues, and the effect of co-leader relationship quality may be stronger. Future research should assess how boundary conditions such as task characteristics may moderate the relationship between co-leader relationship quality and team effectiveness. Further, considering how critical events (e.g., deployments in the Army context) impact the co-leader relationship can provide a deeper understanding of how context may moderate the relationship between co-leader relationship quality and the impact on their subordinates.

Similar to the discussion of hypothesis 4, another explanation for lack of significant findings may be that the co-leaders may hide the true nature of their relationship in order to demonstrate a united front, and therefore the effects of their relationship on team outcomes is minimal. One of the key theories supporting the link between relationship quality and team effectiveness outcomes is social learning theory

(Bandura, 1977), which suggests that subordinates model the behaviors of their superiors. The theory would suggest if co-leaders model effective teamwork behaviors, their subordinates will mimic these behaviors and ultimately be more effective. Co-leader's ability to mask their issues in the outward expression of the relationship may alter the way in which their subordinates perceive them and the behaviors they model. If a co-leader pair has frequent arguments and does not work well together but presents themselves as a unified co-leader team to their subordinates, their subordinates are less likely to learn and model ineffective teamwork behaviors and in turn, perform better and be more satisfied with the team, reducing the effect the poor co-leader relationship has on team performance.

Social learning theory originated in research on how children model behavior to better understand the impact parents have on their children. Since the publication of Bandura's seminal work on social learning theory, there has been decades of research on interparental conflict and behavior modelling in children that can help inform the current research and explain these findings. Meta-analytic findings on parent-child behavior modelling has demonstrated that children's social interactions reflect interparental interactions (e.g., Krishnakumar & Buehler, 2000; Zemp, Bodenmann, & Cummings, 2016). The research further demonstrates that parents who can display positive ways of interacting with each other and handle conflict (despite relational issues) has a positive effect on how their children behave socially and handle conflict (Zemp et al., 2016). In terms of co-leadership, this relationship has been compared to co-parenting because the effects are similar within the subordinate group they lead. One of the key quotations from participant experiences referenced how the subordinates "see everything about [the]

relationship. If [the co-leaders] play mommy/daddy games the platoon would fall apart. Joe is always watching,” highlighting the commonalities between how parents and co-leaders display their relationship to others. Like parents, co-leaders may hide their conflict from their subordinates, reducing the negative impact it has on them.

Co-leader effectiveness and team effectiveness

The link between leader effectiveness and team effectiveness may have been the most well-supported relationship in the previous literature and therefore, it is unsurprising that the findings confirmed this assertion. Both sources of co-leader effectiveness ratings (i.e., supervisor and subordinate ratings) were strongly, positively related to supervisors' ratings of team performance, but only subordinate ratings of co-leader effectiveness were related to team satisfaction. This is likely due to common rating source because the team rated both co-leader effectiveness and their satisfaction. Additionally, supervisors and subordinates have different views of the team and the leaders. An alternate explanation is power; the effect size linking supervisor ratings of co-leader effectiveness to team satisfaction was relatively small (.11), and there was not enough power to detect small effects with this sample ($n = 24$, $1-\beta = .13$).

Although the link between leader effectiveness and team effectiveness has been widely supported in both the leadership and teams literatures (e.g., Kozlowski, & Ilgen, 2006), this finding contributes to our understanding of co-leadership by demonstrating that co-leaders *can* be effective and *can* have a positive impact on key group outcomes, an assertion that has been disputed amongst researchers. Some of the co-leadership research and media opinions vehemently argue that co-leadership *cannot* work (e.g.,

Hackman, 2002; Mintzberg, 1989; Zillman, 2014) and this finding provides evidence that when co-leaders are able to lead effectively, the structure can work.

Goal Congruence

A notable flaw in the current study was the way in which goal congruence was operationalized, which may have contributed to the lack of significant relationships between goal congruence and any of the hypothesized study variables. As described in the study method, PLs and PSGs were asked to list their top 5 goals for the platoon, providing a fairly open-ended measure of goals. Due to the open nature of this measure, the goals had to be categorized so that some of the subjectivity involved in the open-ended responses was removed (i.e., similar goals with different wording could be counted as congruent). As described in the study methods, the categories were drawn from published research on Army competencies which were meant to represent performance standards for which leaders are expected to develop their subordinates. Once the goals were categorized, the list of goals for each dyad member was compared with their counterpart's. Each goal was counted as present or absent in their counterpart's list and scores of 0-5 (no overlapping goals to all overlapping goals) were assigned to each dyad as a measure of *actual* goal congruence.

There has been some discussion in the congruence literature about the best way to measure congruence, specifically, determining whether *actual* or *perceived* congruence is more predictive of key outcomes. The current study used *actual* congruence because the co-leaders are meant to consistently communicate goals downwardly to their team, an action best accomplished when the leaders have the same goals. In this case, *actual* goal congruence was thought to more directly predict whether the leaders were truly on the

same page with the team goals and therefore would be more similar and more likely to provide consistent direction to their team.

However, some literature suggests that *perceptions* of goal congruence can be more strongly related to individual attitudes and behaviors. Kristof-Brown and Stevens (2001) explored both *perceived* and *actual* goal congruence as it relates to team outcomes and found that individual *perceptions* of congruence between their own goals and their team's goals were more strongly related to team and work satisfaction. This is likely because the way in which individuals perceive of the environment may be more strongly linked to attitudes and behaviors, even if not a reflection of the actual environment; individual perceptions reflect one's personal view of the world, regardless of whether that view is accurate. Interestingly, Kristof-Brown and Stevens's (2001) study demonstrated that this may be the case for many individuals as perceived and actual goal congruence had a very small bivariate correlation. Similar results have been found in other studies of congruence, such as in research on person-organization fit (e.g., Van Vuren, Veldkamp, De Jong, & Seydal, 2007).

Despite the recent work comparing actual and perceived goal congruence, previous literature *has* found a link between actual goal congruence and key outcomes (e.g., Vancouver et al., 1994; Vancouver & Schmitt, 1991; Witt, 1998). Taken together, findings from the current study as well as past research suggests that using a combination of perceived and actual goal congruence may be the most informative in assessing how congruence impacts team and group outcomes. Further, several studies have looked at goal importance congruence (e.g., Colbert et al., 2008), which may also provide key information on the link between goal congruence and outcomes of interest. Lastly, as

mentioned in the discussion of congruence on the other six predictors, there are more sophisticated methods of assessing congruence such as polynomial regression that may provide more robust analyses with adequate sample sizes.

Congruence in perceptions of relationship quality

Another aspect of congruence that was unable to be modelled in the current study, but was explored in post-hoc analyses was agreement in relationship quality.

Congruence across perceptions of relationship quality did demonstrate significant relationships with overall relationship quality as well as most of the antecedent variables, but not dyad time together or key leadership and team outcomes (i.e., effectiveness).

Interestingly, much of the research suggests that the longer the dyad spends together, the higher congruence they have in views of their relationship. As the number of shared social interactions increases, each dyad member can base judgements of the relationship on a greater number of common experiences, leading to greater congruence in these judgments. This assertion was not supported in this simple analysis as there was not a significant bivariate correlation between dyad time together and relationship quality congruence. There is some alternate evidence in the LMX research that suggests that the *quantity* of interactions is less important in predicting LMX agreement than the *quality* or depth of interactions (e.g., Sin et al., 2009).

Additionally, prior research has found that higher congruence was related to higher follower job performance, organizational commitment, and job satisfaction, while low congruence was related to intermediate levels of these outcomes (Cogliser, Schriesheim, Scandure, & Gardner, 2009; Sin et al., 2009). It is possible that the current study did not replicate these findings because prior research on LMX congruence has

focused on individual-level outcomes, rather than dyadic outcomes. Another possible explanation may be that perceptions of co-leader effectiveness and team effectiveness are more strongly correlated with unmodelled variables such as subordinate and superior perceptions of the co-leaders, the image the co-leaders project, and the behaviors they engage in with the team, as mentioned earlier in the discussion. Additionally, as argued, congruence alone does not provide as much information on the link between relationship quality and outcomes of interest; both the quality of relationship (high or low) and the agreement on quality (both members view it as high or low) can provide the most insight into these relationships.

Overall, the findings from this post hoc exploration are interesting and suggest that not only is congruence in the antecedent variables possibly a moderator in the model but congruence in relationship views may be as well. Future research on co-leadership should include this measure of congruence (or perceived congruence) in the prediction of key outcomes as well as probe antecedents to congruence. Developing a high-quality relationship between co-leaders is important and useful to the extent that both leaders see it this way.

Overall summary and discussion of time.

Overall these results demonstrate that the several of the proposed co-leader processes do impact relationship quality and other key dyadic and team outcomes, but not as consistently across subsamples and raters. These processes demonstrated slightly different patterns and strength of prediction across different levels, outcomes, and rating sources, which suggests two main issues to consider when interpreting the model. First, caution should be used when drawing inferences on which predictors are or are not

important. As demonstrated, there was a wide range in power, as well as slightly different sets of participants and dyads across different analyses. This may be a large contributing factor to the differences across results, suggesting the effects are slightly unstable with smaller samples.

Second, many of these processes and outcomes have moderate to large bivariate correlations with each other, and while multicollinearity was addressed in some of the analyses, it was not possible to assess all relationships in the full model as they exist in the presence of each other. This creates a problem with omitted variables for each analysis and including all variables in one comprehensive model (with adequate power) would likely be more informative. In addition to omitting some of the measured variables in each separate analysis, one key omitted variable that was not included in this study but may have a large impact on the model, is time. Although dyad time together served as a proxy and control for time, understanding how these processes develop and function over time is imperative. The next section will discuss the importance of including time in this model in future research.

The role of time in the model

The current study was unable to collect data over multiple timepoints and therefore cannot make strong inferences about the impact of time on co-leader relationship quality and key outcomes. However, data was available on participant Army, company, and platoon tenure. Exploratory analyses regarding tenure were conducted to determine appropriate controls during hypothesis testing as well as to provide some information on available time-related variables. At the dyad-level (Table 5), PSG platoon tenure was positively correlated with goal congruence, the only variable

in the model to relate to goal congruence. PSGs often have spent more time with the platoon compared to PLs, who rotate in and out of the platoon more frequently. A PSG that has spent a long time with their current platoon may have a clearer understanding of the necessary goals to strive for and may communicate this better to the incoming PL, creating more congruence between the leaders. PLs and PSGs that are both relatively new to the platoon may not have as strong of an understanding of past platoon performance and future needs, and therefore may be more likely to independently assess the situation and determine goals that may not align as well with their counterpart's views.

At the individual level, Army tenure and company tenure were positively related to role clarity for PLs. This is unsurprising given that when a PL is first commissioned to the Army, they have had little to no prior Army experience outside of their military training academy or ROTC program. Much of the education and training PLs receive prior to being commissioned involves higher level military strategy, and they must learn how the Army functions day-to-day and how their role fits into the platoon during their first assignment. This requires quick learning and PLs that have been in the Army for longer, are much more likely to have gained this understanding compared to newer PLs. The range in PL tenure in the current sample is less than 1 month to 44.78 months, suggesting a wide range in understanding of the PL role within the Army.

Although tenure provides some insight into how time may impact co-leaders, it does not adequately address how their relationship may develop and change over time. The fundamental component of social exchange theories (e.g., interdependence theory; Kelley, 1979; Kelley & Thibaut, 1978; Thibaut & Kelley, 1959; social exchange theory;

Blau, 1964) is that relationships unfold over time as they develop and are judged over a series of interactions between both parties. The quality of these interactions, as well as events that occur along the way, impact the way in which each individual assesses the costs and benefits of the relationship (Kelley, 1979; Kelley & Thibaut, 1978; Rusbult & Buunk, 1993; Thibaut & Kelley, 1959).

Understanding how relationships unfold over time can provide insight into time-related phenomena such as relationship spirals. Research on the spiraling effect of human behaviors, thoughts, and interactions spreads across many disciplines (e.g., organizational decline, self-efficacy, trust, and incivility). Spirals occur when there is a pattern of increases or decreases in behaviors, thoughts, and situations, for example, that are “created by human actors because they lack adequate understanding of their situation or are unwilling or unable to alter their behavior (Masuch, 1985)” (Andersson & Pearson, 1999, p. 458). Incivility research in particular has focused on spirals as they relate to human interactions and incivility. Anderson and Pearson (1999) describe “incivility spirals,” as instances in which uncivil exchanges escalate in severity and can ultimately lead to violence. Similarly, in a social exchange relationship context, early exchanges may be strong enough (positive or negative in nature) to impact the following set of exchanges (positively or negatively) and so on until the relationship is judged as extremely poor and is terminated or is judged as extremely positive and continued. Research on how these spirals may impact co-leaders, and possible interventions to stop the effects of negative spirals is key in helping co-leaders maintain positive and effective working relationships.

In addition to time being a key component in relational development, much of the organizational research and related fields have called for more attention to time in all contexts. In a recent review of the industrial-organizational psychology literature over the past century, Salas, Kozlowski, and Chen (2017) call for more longitudinal research in the field. Researchers of groups and teams are particularly adamant that future studies include a time component because the most widely used models of team effectiveness (e.g., the IMOI model; Ilgen et al., 2005) follow the process of inputs-mediators-outputs-inputs, suggesting a cyclical nature of team development and functioning (e.g., Mathieu et al., 2017). Cross-sectional research can rarely adequately capture the complexities of team functioning and interpersonal relationship development, and therefore, longitudinal methods are necessary.

Despite calls for more longitudinal research, there are inherent difficulties in collecting longitudinal data with adequate sample sizes, especially in the co-leader context. Future research that is unable to include multiple time points in the research design should consider alternative methodologies to act as stronger proxies for time than tenure. Event-based analyses (e.g., Morgeson, 2005) may help capture information about co-leader relationships before, during, and after events, providing some information on how the event or situation impacted the relationship over time.

Practical Implications

Although the findings in the current study may not be as consistent across levels and analyses or as robust as expected, they do provide insight into possible practical applications for this research. The largest practical application is leader development and training. Much of the leader development research focuses on individual leaders and

their relationships with their subordinates, but does not address how to develop multiple leaders that must cooperate to co-lead. Training individual leaders separately, in hopes they will work well together is not enough, as effective co-leadership is not simply the sum of the two parts. On the other end of the spectrum, the research on team functioning and shared leadership has examined the emergence of shared leadership in teams and how to foster an environment that facilitates effective shared leadership. The current study brings the two fields together and provides evidence that there are actionable antecedents to effective co-leadership that can be improved using a combination of the leadership development research and the team process research.

Before delving into the development and training literature, it is important to note why the model presented is more actionable than much of the current research on social relationships in leadership (i.e., LMX). To start, the leader-member exchange research acknowledges the importance of developing high quality relationships between leaders and followers (e.g., Graen & Uhl Bien, 1995); however, most of the discussion of antecedents of LMX revolves around perceptions of similarity, a factor that is difficult to change. Statements are often made of the importance of “develop[ing] competencies necessary for building high quality LMX and TMX” (Banks et al. 2014; Yukl & Lepsinger, 1995); however, the research on antecedents of LMX does not always support developing *competencies*, but rather focuses on antecedents of similarity such as surface- and deep-level diversity. Surface-level diversity refers to observable demographic characteristics such as gender and age while deep-level diversity refers to unobservable characteristics such as attitudes and values (Jackson, May, & Whitney, 1995; Harrison, Price, & Bell, 1998; Miliken & Martins, 1996). Surface-level demographic

characteristics are unchangeable and deep-level characteristics may also often unchangeable or extremely difficult to alter, such as deeply ingrained attitudes and values. Therefore, research on training and developing relationships in the workplace should focus on factors that can be altered or improved such as competencies, rather than personal attributes that likely cannot.

The current study answers the call to inform interventions that develop these competencies by focusing on antecedents of relationship quality rooted in skills and behaviors that can be developed and improved upon. The model purposefully omits demographic and personality constructs that are known to relate to perceptions of similarity and in turn liking. For example, as mentioned, perceptions of demographic similarity (e.g., surface-level characteristics such as gender) are immutable; however, the way in which two individuals communicate or make decisions can be altered. These changeable antecedents parallel many of the constructs in the team process literature that can be developed and improved upon so that teams may work more effectively together, such as joint decision-making, conflict management, and communication (e.g., Marks et al., 2001; Salas et al., 2005).

Throughout the history of leadership research, the view of what makes a good leader has changed drastically, and more recent emphasis has been placed on leader development as an ongoing, long-term, and social process in which leaders and groups of leaders learn to development themselves, learn from experiences, and interact more effectively with their leadership partners and subordinates. Currently, the most common approach to leader development in organizations is through 1) formal institutional education, 2) operational assignments, and 3) self-development (Salas, Burke, Stagl,

2004; Sullivan, 1999). This three-pronged approach helps leaders learn necessary KSAOs, gain valuable learning experiences, and teaches leaders to take control of their own development (Salas et al., 2004). Although this approach has been shown to be successful in many organizations and contexts, there has been little research conducted on how individual leader development translates to co-leader development.

Day (2014) makes this important distinction between developing individual leaders and developing leadership processes among multiple leaders and argues that research and practice cannot rely on applying theories of individual development to development of multiple leaders. Current leader development theory acknowledges that leader development is inherently a social process in which individual leaders and groups of leaders learn to interact with each other and their subordinates to provide effective direction, and development of co-leaders is no different. Not only do co-leaders need to learn effective leadership skills themselves, but they also need to develop the necessary competencies to work well together.

One way in which co-leader development can incorporate these inherently social processes of co-leading is through combining key factors from leader development with team development. As mentioned, the leader development literature provides a solid foundation suggesting that development is rooted in developing the necessary competencies for effective leadership, is long-term, and emphasizes the importance of key developmental experiences. The groups and teams literature can provide additional support for developing competencies within the social context of a team, rather than an individual.

The teams literature has identified clear processes in which teams engage to allow them to be effective. Marks et al. (2001) and Salas et al. (2005) developed two widely used frameworks for understanding the behaviors that contribute to team functioning. The models include behaviors such as helping behaviors, goal setting, strategic planning, communication, and decision-making. There is a plethora of research using these models that supports the authors' assertions that high quality team processes are related to key individual and group outcomes (e.g., LePine et al., 2008).

Along a similar vein, the teams research has identified that not only is it important for teams to engage in high quality processes and interactions, but it is also important that they share perceptions of the team – what the research has labeled a shared mental model. The term mental model refers to humans' internal views or representations of the world (Holyoak, 1984), and shared mental models in the teams process context refers to “socially constructed cognitive structures that represent shared knowledge or beliefs about [the team] environment and its expected behavior” (Druskat & Pescosolido, 2002, p. 284; Holyoak, 1984). Teams that have well-developed shared mental models tend to exhibit higher quality processes and in turn, performance (Dionne et al. 2010; Klimoski & Mohammed, 1994; Levine & Moreland, 1991; Mathieu et al., 2000; Weick & Roberts, 1993).

Some of the most useful findings surrounding team mental models, is that this shared cognition can be developed and in turn improves team functioning. Hunter et al. (2017) draw upon shared mental model theory to posit ways in which shared mental models can help co-leader effectiveness, they argue that “shared mental models of strategic orientations allow [co]-leaders to successfully tackle a portion of [a] project they

are tasked with, while trusting their partner to manage the other portion” (p. 1189). If we treat co-leaders as small teams and apply what we know from both the leader development and team process literature, we can create helpful training programs aimed at improving both co-leader team processes and shared cognition of how to most effectively co-lead. These programs could be administered prior to forming co-leadership teams or as necessary interventions throughout their tenure as leadership partners

One of the most well-established means of developing team mental models is through team charters. Team charters are “codified plans for how the team will manage teamwork activities” (Mathieu & Rapp, 2009, p. 91). Further, these charters allow teams to create structured agreements among the members regarding processes such as how the work will be done, how decisions will be made, outlining roles and responsibilities, creating mechanisms for member accountability, identifying members’ strengths, weaknesses, and specific knowledge, as well as what the team’s mission, goals, and objectives are, and how performance will be monitored (Mathieu & Rapp, 2009). Team charters can be flexible and specific to the needs of the team to ensure shared cognition on the aspects of team functioning most important to accomplishing the tasks and goals set out for that team. Overall, team charters improve effectiveness by creating clear expectations and focus joint behaviors and activities for goal accomplishment (Fisher et al. 1995; Mathieu & Rapp, 2009).

Mathieu and Rapp (2009) acknowledge that past research on team charters has shown mixed findings as to whether or not they improve team performance. For example, Tannenbaum, Beard, & Salas (1992) suggest that team building approaches often have

stronger effects on attitudinal outcomes but are not as useful in improving team performance. More recently, Courtright, McCormick, Mistry, and Wang (2017) conducted a study in which the effect of team charters was assessed when controlling for team conscientiousness. Their findings demonstrate that team charters do predict performance, but are most useful for teams low in conscientiousness to start. This suggests that many teams may already possess the necessary characteristics (e.g., conscientiousness) to be successful, but that for those that do not, team charters are beneficial. This is unsurprising as many teams or co-leaders may be predisposed to work better together for a variety of reasons and may not need an intervention to improve upon their team processes. However, for the co-leader teams that are not likely to engage in effective processes from the start, this type of intervention could be beneficial.

Not only can competency-based training and development improve upon the interactions and co-leader processes in which the co-leaders engage and in turn improve their effectiveness as leaders, they can also help to indirectly improve team outcomes through improving relationship quality as demonstrated in other research fields. In many fields outside of organizational psychology, decades of research has been conducted on improving relationships through intervention. Most commonly, the parenting literature has identified the need for interventions designed to improve interparental relationships in order to ameliorate the negative effects of poor relationship quality on children (e.g., Zemp et al., 2016). As mentioned earlier in the discussion, the interparental relationship can impact behaviors in children and research has shown that “interventions focusing on the enhancement of interparental relationship[s] may also lead to the improvement of child well-being” (Zemp et al., 2016, p. 102). For example, parents that have been

trained in constructive communication are more likely to “display adaptive, prosocial ways of handling disagreements that children may observe, internalize, and imitate in their own relations” and additionally, interventions to reduce interparental conflict have been shown to help improve “parenting strategies *across* parents (good communication reduces parenting differences) as well as *within* each parent (same practices independent of whether or not the partner is present)” (Zemp et al., 2016, p. 102).

Overall, research from a variety of fields (leadership, teams, parenting) has demonstrated that targeted behavioral and skill-based interventions are a critical component of broader team leadership development and can help improve the interpersonal relationship and team processes between individuals, and may ultimately have positive impacts on their subordinates. It is important to note however, that discrete behavioral interventions may not be sufficient. As mentioned, Day (2014) highlights the importance of more comprehensive views of leadership development beyond competency-based training. For example, leadership identity has been shown to be a key driver of leader development (e.g., Day et al., 2009; Lord & Hall, 2005; van Knippenberg & Hogg, 2003) and draws attention to potential avenues for co-leader development research on creating a collective identity. This idea will be explored further in the future research section below. Despite the need for a multi-pronged approach to leader development, the current study provides preliminary evidence that there are both behavioral factors and developable competencies that impact co-leader processes and effectiveness, ultimately setting the stage for the development of co-leader training interventions that can be incorporated into broader leader development.

Future Research

There are many avenues for future research on co-leadership and the current study provides a solid foundation from which to build. As mentioned, effectively modelling time and congruence in dyadic constructs is imperative. Not only does future research need to focus on methods that allow sufficient modelling of how time impacts co-leadership processes but also needs to more adequately model congruence. This involves using more sophisticated methods of modelling dyadic agreement (e.g., polynomial regression), as well as incorporating suitable alternatives to these methods when using smaller samples. Including both perceived and actual congruence within the study of co-leaders may be more informative of both subjective relationship-oriented outcomes (e.g., relationship quality) as well as more objective effectiveness-related outcomes (e.g., co-leader effectiveness and team effectiveness). Additionally, the current study highlighted the need for more in-depth investigation of perceptions of the co-leaders from both their subordinates and their superiors. Specifically, perceptions may play a strong role in how the co-leaders relationship and behaviors are modelled to their subordinates.

One of the social processes that was not previously discussed that may play a role in the ways in which co-leaders interact with each other and their subordinates is power within the relationship. Etzioni (1965) noted the importance of considering power in dual leadership situations. He suggested that co-leaders may be perceived differently based on the amount of power they have within the organization, as well as the power differential between the leaders themselves. Previous literature on LMX suggests that the salience of power differentials between leaders and followers is indicative of lower quality relationships (e.g., Fairhurst & Chandler, 1989). Additionally, research on TMX suggests that the “sharing of power and authority in the completion of the team’s tasks

[supports] perceptions of self-determination,” a key factor that comes into play when individuals assess relationship quality (Liden, Wayne, & Sparrowe, 2000). Although these findings involve power at different levels (leader-follower, team), future research should incorporate this work into explorations of power within leader-leader exchange relationships. Formal power differentials between co-leaders is not specific to the Army, much of the co-leadership research suggests that one leader often has more formal authoritative power over the other in order to facilitate decision-making strategies and to avoid the potential gridlock associated with two leaders that cannot agree (De Voogt, 2006; Krause et al., 2015).

Similar to issues of power differentials, future research should focus on the influence processes within co-leader dyads and within the team. Recently, leadership theory has moved towards a more relational-approach in which leadership can be considered a process of social construction (e.g., Relational Leadership Theory; Uhl-Bien, 2006) in which leadership is both claimed and granted (De Rue & Ashford, 2010). These theories have gained popularity and suggest that understanding the social influence dynamics within a group or team is imperative to understanding leadership. The current study focuses mostly on understanding broad antecedents and outcomes of co-leader relationship quality, rather than on the informal social influence processes at play. The field would benefit from more in-depth explorations of how co-leaders mutually influence each other as well as the complexities of having multiple leaders attempting to jointly influence subordinates.

Lastly, the role of leader identity in co-leadership situations is not well understood. As mentioned briefly, the leader development literature acknowledges that

leader identity is essential to effective leader development (e.g., Day et al., 2009; Lord & Hall, 2005; van Knippenberg & Hogg, 2003). The way in which individuals view themselves (self-identity) and the selves they strive to be (idealized self) are key drivers of work-related behaviors and choices (Farmer & Van Dyne, 2010). The idea of an idealized self was first presented by McCall and Simmons (1978) and reflects “how people see themselves and what is important to them, given their needs and desires...thus identity reflects priorities that guide actions across situations and over time” (Farmer & Van Dyne, 2010, p. 504; Stets, 2006). Viewing oneself as a leader or hoping to view oneself as a leader, has major implications regarding what actions individuals engage in, their motivation to lead (Guillen, Mayo, & Korotov, 2015), leadership self-efficacy, engagement in leader development experiences (Miscenko, Guenter, & Day, 2017), and ultimately, leader effectiveness (e.g., Ng, Ang, & Chan, 2008).

A key component of identity that is missing in the co-leadership research is the development of a collective identity as co-leaders. Recently, the broader leadership research has investigated the role of collective identity in leadership and suggests that leaders who demonstrate a stronger collective identity with the team or organization are more motivated to lead (e.g., Chrobot-Mason, Gerbasi, & Cullen-Lester, 2016; van Knippenberg, 2000), are more likely to “internalize the values and norms of their group, successfully fulfill social roles and obligations, and contribute to the group’s welfare” (Chrobot-Mason et al., 2016, p. 301; Johnson, Venus, Lanaj, Mao, & Chang, 2012), and may ultimately be more successful (Ibarra, Wittman, Petriglieri, & Day, 2014). These findings have major implications not only for individual leadership, but also for many forms of plural leadership (Chrobot-Mason et al., 2016), suggesting that co-leaders that

have a stronger collective identity as co-leader partners may be ultimately more connected to the role and each other and in turn, more effective. Future research should explore this idea and extend the current research on developing individual and collective identities.

Limitations

The current sample of Army co-leaders is both a strength and a limitation. To start, the strength of this sample is the relatively strong and controlled environment in which these leaders operate. This level of control allows for stronger comparisons across co-leader dyads because each co-leader team operates under relatively similar and controlled situations. For example, each co-leadership pair falls on the same level of the organizational hierarchy, leads a platoon of enlisted Soldiers, reports to a company-level co-leadership team, and is part of a larger company, battalion, and brigade. The main way in which PL-PSG leadership pairs differ is based on their military occupational specialty, which dictates daily tasks, work location, and deployment, among other things. Much of the previous quantitative research on co-leaders has sought to compare leaders across organizations and industries (e.g., co-CEOs), which provides very limited control. In these situations, there are many unmeasured, extraneous influences on the measured co-leader outcomes (e.g., organizational success variables), limiting comparability across dyads.

Although control is beneficial in the current study, it does limit generalizability of the findings across samples. As mentioned, the Army operates in a very controlled environment that differs in many ways to other non-military or government organizations and industries. Further, despite the broader organizational theories providing evidence

for the hypothesized relationship within the model, the proposed model also partially originated from focus groups with an Army sample. Future research should attempt to replicate these findings in a non-military setting in order to determine whether these findings generalize to other samples.

Another limitation with the current sample is sample size. Due to the complexities of gaining access to a large number of complete co-leader dyads, as well as obtaining multisource effectiveness data for all co-leader dyads and their teams, the sample size in the current study is relatively low. A priori power analyses suggested the current sample was adequate for detecting medium to large effects for the included analyses; however, there may have not been adequate power to detect the smaller observed effects. Achieved power for the reported analyses had a wide range suggesting relatively low power for detecting significance in some of the smaller bivariate correlations. Additionally, the included models were relatively simple given the sample size; however, the full model was proposed to operate simultaneously. The current sample size does not allow for simultaneous analysis of all relationships, limiting the inferences we can draw from the results. For example, there are several hypothesized mediators that were unable to be tested as such and many study variables likely share variance in predicting key outcomes.

One issue that is arguably a bigger drawback than the sample size, is the homogeneity of the sample. We were unable to formally collect demographic information on gender and ethnicity, but the sample was comprised of mostly Caucasian men. Much of the social exchange research suggests that individuals tend to like other who are similar to themselves (e.g., similarity-attraction paradigm; Byrne, 1971), and the

diversity and inclusion literature suggests that women and ethnic minorities face more challenges at work as minorities. Given that the core of the current study revolves around social relationships, it is important to understand how gender and ethnicity may play a role in how co-leaders interact with each other and their team. Future research should strive for a more representative sample and examine whether surface-level demographic characteristics impact co-leader relationships and effectiveness.

Lastly, there were several measurement limitations. To start, social relationships inherently develop and change over time; however, the current data collection was limited to one time point. Although the data allowed for the analyses to control for the length of time the dyad has been together, the data only captured a small glimpse into the relationship between the two leaders at the point in time at which the data collection occurred. Additionally, due to lack of availability of computers, the survey was administered as a paper-and-pencil test. Although the paper-and-pencil aspect likely did not alter the quality of the quantitative data (Weigold, Weigold, & Russell, 2013), it did require participants to be physically present at a specified time, potentially limiting the number of participants that could be made available for the data collection.

As with all organizational research, it is a challenge to gain participation from a large number of individuals, allowing the flexibility to take the survey online may have increased participation from individuals unable to attend the in-person data collection. This was a particular drawback to gaining participation from a larger number of subordinate platoon members. Full platoons were not available to attend data collection sessions, and therefore, the current sample represents a subset of the platoons that were able to participate. In some cases, participation was as little as two members. This also

limited the amount of linkable multisource data we had for each dyad, resulting in a smaller sample size for analyses requiring multisource data. However, despite these limitations, the current study remains one of the few studies able to collect quantitative data on a larger number of current co-leaders.

Conclusion

The current study provides a significant contribution to the co-leadership literature in three main ways. To start, much of the current research on co-leadership has relied upon two main methods, in-depth qualitative analysis and the use of archival publicly available organizational data. Although these methods have provided rich insights into the personal experiences of co-leaders as well as provided information on objective organizational outcomes, there are still several gaps in our understanding of co-leadership. Relying solely on these two methods, the field remains divided on whether co-leadership can work and whether this structure should be used at all. The current study finds a methodological middle ground in gathering a larger number of current co-leaders and quantitatively testing a set of hypotheses related to the factors that impact co-leadership outcomes. I answer the question of *how does co-leadership work* rather than *does co-leadership work*, which has been the focus of much of the research to date. This is an important distinction because, despite the debate of whether co-leadership works, there is some evidence that it *can* work, but we lack a body of research that shows *how* it can work and *why* it may fail.

Secondly, the current study contributes to our understanding of this structure by incorporating key theories from a variety of fields to develop a comprehensive model of antecedents and outcomes of co-leadership. I draw upon theory from fields such as

leadership, group and team dynamics, social psychology, and research on parenting to demonstrate what impacts co-leaders and how co-leaders impact their subordinates and key team outcomes. Lastly, despite the study limitations and lack of significant findings in some areas, the current study provides a solid foundation from which future research can draw upon. Both the theoretical development and study findings contribute to identifying key practical applications as well as several avenues for future research.

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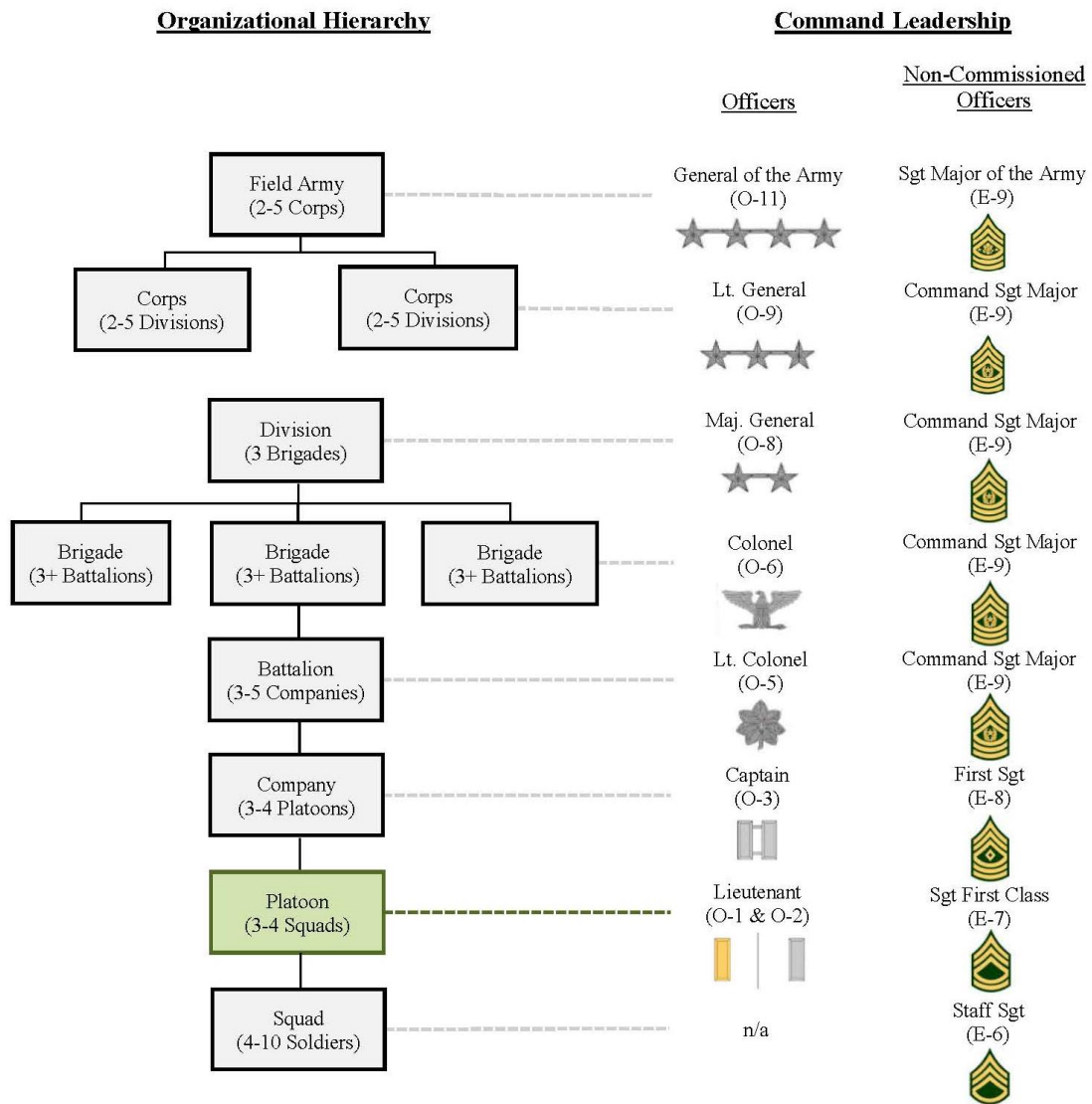
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Appendix A

Organizational Hierarchy: Elements and their Leaders



Note. The green box for “platoon” indicates this is the target level of interest within the organization.

Appendix B

Informed Consent

Title: Platoon Leader-Platoon Sergeant Co-Leadership

Purpose of the research: This research project is designed to gather information on the working relationship between platoon leaders (PLs) and platoon sergeants (PSGs) and understand how the relationship impacts platoon effectiveness.

What you will be asked to do in this research: You are being asked to complete a survey regarding leader relationships in your platoon as well as your platoon's effectiveness.

Voluntary participation: Your participation is voluntary. You may choose not to participate or discontinue participation at any time without penalty or loss of benefits. You may choose not to provide responses to any or all questions. By participating, you are also allowing us to use the information collected during this session in the future for other approved research projects.

Confidentiality: We will not identify you, nor your unit, and we will NOT include your name or other personally identifiable information in subsequent reports or presentations. All data collected will be treated confidentially and compiled, analyzed and reported at the group level. No identifiable responses will be reported. Any information you provide will be combined with the information we receive from the other individuals and units being surveyed.

We cannot provide "confidentiality" or "non-attribution," to participants regarding any comments disclosing criminal activity/behavior, or statements that pose a threat to self or others. DO NOT discuss or comment on classified or operationally sensitive information during the session.

Time required: 60 minutes.

Risks: We do not anticipate that your participation has any greater risks than would be encountered in everyday life and normal activities. While there is always a risk of inadvertent disclosure in any research effort, we have procedures in place to ensure this risk is minimal.

Benefits: There is no direct benefit to you associated with your participation but your responses will help us improve platoon effectiveness.

Compensation: No compensation is provided for your participation.

Whom to contact if you have questions about this research: You should send your questions to usarmy.belvoir.hqda-ari.mesg.surveys@mail.mil. Reference project name: Platoon Leader-Platoon Sergeant Co-Leadership.

Whom to contact about your rights in this research or if you experience a research related injury: Contact usarmy.belvoir.hqda-ari.mesg.surveys@mail.mil. Reference project name: Platoon Leader-Platoon Sergeant Co-Leadership.

If responding to any of the questions becomes unpleasant for you, you can withdraw from the discussion at any time. If you feel you'd like to confer with someone confidentially after this discussion, please go to the Military OneSource web site (<https://www.militaryonesource.mil>) or call the 1-800-342-9647 number.

ebm IRB 18-26 08May19
Expires 09May20

Appendix C

Pre-Survey Script – Platoon Leader-Platoon Sergeant Co-Leadership

Introduction and Research Purpose

Good morning/afternoon. Thank you for being here today. My name is _____ and this is my colleague _____. We are with the U.S. Army Research Institute and are here to conduct a survey on leader relationships and platoon effectiveness. The goal is to understand and improve working relationships at the platoon level and increase platoon effectiveness.

You will be asked to complete survey measures of how well you think relationships within your platoon are working and how well you think your platoon is performing. There are no right or wrong answers. Your responses are important for improving platoon effectiveness.

Survey Procedures

Before we begin, I'd like to provide a few details about this session. We'll be using a survey format to gather information.

No information you provide will be connected to your name. When responding to any open-ended questions, we ask that you please refrain from using Soldiers' real names or any other identifying information. We are collecting data from several units and installations. All information will be reported in aggregate form and will not be shared with anyone in your chain of command. We are collecting this information for research purposes; no one outside our research team will have access to the data or your individual or unit responses.

(talk about use of PL-CO-BN-BGDE identifier here)

Consent Form

Please review the Informed Consent form.

(Wait a few minutes.)

For protocol purposes, I need to make sure we cover specific information with respect to your rights so let me review key information from the Informed Consent Form before we begin. (1) Participation is voluntary; you do not have to participate (2) You may choose not to participate or you can stop participating at any time and there is no penalty if you do not participate; (3) You may choose not to provide responses to any or all questions; (4) Data collected will be treated confidentially; (5) Data will be compiled, analyzed, and reported at the group level; (6) No individual responses will be reported; (7) We cannot provide "confidentiality" or "non-attribution" to participants regarding any responses disclosing criminal activity/behavior, or statements that pose a threat to self or others; (8)

DO NOT discuss or provide information on classified or operationally sensitive information during the session.

If a participant does not wish to participate either before or during the session:

Junior Enlisted Soldiers: “I completely understand. Please sit quietly until the end of the session.”

Officers and NCOs: “I completely understand. You are free to leave at this time.”

Do you have any questions for me at this time?

(Answer any questions at this time.)

Platoon level:

In front of you, you have a survey packet and a scantron. DO NOT fill out the top of the scantron. We DO NOT want your SSN or other identifying information. Please only fill in the Form and Special Codes sections based on the top of your survey packet. You all should have Form ____ and your Special Code should be 4 digits that go in spaces A-D.

Please mark your answers to the survey items on the scantron sheet using the corresponding question numbers. Use a No.2 pencil only and fill in the bubbles completely. Please let us know if you have any questions while completing the survey.

Company level:

(Run through Research Product script and information sheet before having participants complete the survey packet).

In front of you, you have a survey packet. Within the packet, there are rating sheets for each of your platoons. Please rate EACH platoon in terms of unit performance, platoon leader performance, platoon sergeant performance, and the performance of the leaders as a team. If you need additional rating sheets, please let us know. [Each packet contains 5 sets of rating sheets.]

Appendix D

Measures: Original Item Wording and Adapted Wording for Army Sample

Co-Leader Dyad Scales

Role Expectations (Role Ambiguity, Sawyer, 1992)

Original Item Wording

Instructions: Please indicate the level of certainty you feel about each of the following statements in regards to your roles and responsibilities:

1. The degree of clarity felt about my duties and responsibilities.
2. The goals and objectives for my job.
3. How my work relates to the overall objectives of my work unit.
4. The expected results of my work.
5. What aspects of my work will lead to positive evaluations.
6. How to divide my time among the tasks required of my job.
7. How to schedule my work day.
8. How to determine the appropriate procedures for each work task.
9. The procedures I use to do my job are correct and proper.
10. Considering all your work tasks, how certain are you that you know the best ways to do these tasks.

Adapted Item Wording

Instructions: Please indicate the level of certainty you feel about each of the following statements in regards to your and your counterpart's roles and responsibilities:

1. The degree of clarity felt about our duties and responsibilities.
2. The goals and objectives for our respective jobs.
3. How our work relates to the overall objectives of our unit.
4. The expected results of our work.
5. What aspects of our work will lead to positive evaluations.
6. How we both should divide our time among the tasks required of our jobs.
7. How we should schedule our workday.
8. How we determine the appropriate procedures for each work task.
9. The procedures we use to do our respective jobs are correct and proper.
10. Considering all your and your counterpart's work tasks, how certain are you that you know the best ways you both should do these tasks?

**Decision-Making Behaviors (Empowering Leadership Questionnaire:
Participative Decision-Making Facet; Arnold et al. 2000)**

Original Item Wording

Instructions: Please indicate the extent to which your external team leader performs the following behaviors:

1. Encourages work group members to express ideas/suggestions.
2. Listens to my work group's ideas and suggestions.
3. Uses my work group's suggestions to make decisions that affect us.
4. Gives all work group members a chance to voice their opinions.
5. Considers my work group's ideas when he/she disagrees with them.
6. Makes decisions that are based only on his/her own ideas.

Adapted Item Wording

Instructions: Please indicate the extent to which you and your counterpart engage in the following behaviors when you make decisions:

1. We encourage each other to express ideas and suggestions.
2. We listen to each other's ideas and suggestions.
3. We use each other's suggestions to make decisions that affect the platoon.
4. We give each other a chance to voice our opinions.
5. We consider each other's ideas when we disagree with them.
6. We make decisions that are based on only one of our ideas.

Communication (Team Communication; Earley & Gibson, 2002)

Original Item Wording

Instructions: Please indicate the extent to which each statement is accurate about your team:

1. There is poor information flow in this team.
2. Members of this team keep in touch effectively.
3. There is open communication in this team.
4. Everyone has a chance to express their opinion.
5. Members feel free to make negative comments.
6. We maintain a high level of idea exchange.
7. One or two members tend to dominate the discussion.

Adapted Item Wording

Instructions: Please indicate the extent to which each statement is accurate in regards to communication between you and your counterpart:

1. There is poor information flow between us.
2. We keep in touch effectively.
3. There is open communication between us.
4. Each of us has a chance to express our opinions.
5. We feel free to make negative comments.
6. We maintain a high level of idea exchange.
7. One of us tends to dominate the discussion.

Conflict Culture Scale (Gelfand, 2018)

Original Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements about your team:

1. People do everything to win for themselves.
2. People fight for what they want personally.
3. People try to force others to accept their own points of view.
4. People search for gains for only themselves.
5. People criticize others behind their backs.
6. People use passive-aggressive means to handle it.
7. People stab each other in the back when the other party isn't looking.
8. People examine issues until we find a solution that satisfies everyone.
9. People examine ideas from all sides to find a mutually optimal solution.
10. People work out a solution that serves everyone's interests.
11. People try and come up with creative solutions that incorporate multiple perspectives.
12. People conceal conflicts to maintain the appearance of harmony.
13. People avoid openly discussing conflicts.
14. People suppress conflict, even if they are upset.
15. People are very reluctant to openly talk about conflict.

Adapted Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements about how you and your counterpart manage conflict:

1. We both do everything to win for ourselves.
2. We both fight for what we want personally.
3. We try to force each other to accept our own points of view.
4. We both search for gains for only ourselves.
5. We criticize each other behind each other's backs.
6. We use passive-aggressive means to handle conflict when it comes up between us.
7. We stab each other in the back.
8. We examine issues until we find a solution that works for us both.
9. We examine ideas from all sides to find the best solution for us both.
10. We work out a solution that serves both our interests.
11. We try to come up with creative solutions that include multiple viewpoints.
12. We hide conflicts to maintain the appearance of harmony.
13. We avoid openly talking about conflicts.
14. We suppress conflict, even when we are upset.
15. We are very reluctant to talk openly about conflict.

Willingness to Learn (Learning Capacity: Promotive Interaction Facet; Gladstein, 1984)

Original Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements:

1. On this team I like to share my ideas and work material with other members of the team.
2. On this team I can learn important things from other team members.
3. On this team I like to help my teammates learn.
4. On this team I like to share my ideas and work materials with my teammates when I think it will help them.
5. On this team it is a good idea for teammates to help each other learn.
6. On this team I like to cooperate with my teammates.
7. Members of my team learn a lot of important things from each other.

Adapted Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements:

1. We like to share ideas and work material with each other.
2. We can learn important things from each other.
3. We like to help each other learn.
4. We like to share our ideas and work materials with each other when we think it will help.
5. It is a good idea for teammates to help each other learn.
6. We like to cooperate with each other.
7. We learn a lot of important things from each other.

Support & Empower (Empowering Leadership Questionnaire: Showing Concern/Interacting with the Team Facet; Arnold et al. 2000)

Original Item Wording

Instructions: Please indicate the extent to which your external team leader performs the following behaviors:

1. Cares about work group members' personal problems
2. Shows concern for work group members' well-being
3. Treats work group members as equals
4. Takes the time to discuss work group members' concerns patiently
5. Shows concern for work group members' success
6. Stays in touch with my work group
7. Gets along with my work group members
8. Gives work group members honest and fair answers
9. Knows what work is being done in my work
10. Finds time to chat with work group members

Adapted Item Wording

Instructions: Please indicate how often you and your counterpart engage in the following behavior:

1. Care about each other's personal problems.
2. Show concern for each other's well-being.
3. Treat each other as equals.
4. Take the time to discuss your concerns patiently.
5. Show concern for each other's success.
6. Stay in touch with each other.
7. Get along with each other.
8. Give each other honest and fair answers.
9. Know what work each other is doing.
10. Find time to chat with each other.

**Co-Leader Relationship Quality (Multidimensional Leader-Member Exchange;
Liden & Maslyn, 1998)**

Original Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements:

1. I like my supervisor very much as a person
2. My supervisor is the kind of person one would like to have as a friend
3. My supervisor is a lot of fun to work with
4. My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question
5. My supervisor would come to my defense if I were 'attacked' by others
6. My supervisor would defend me to others in the organization if I made an honest mistake
7. I do work for my supervisor that goes beyond what is specified in my job description
8. I am willing to apply extra efforts, beyond those normally required, to meet my supervisor's work goals
9. I do not mind working my hardest for my supervisor
10. I am impressed with my supervisor's knowledge of his/her job
11. I respect my supervisor's knowledge of and competence on the job
12. I admire my supervisor's professional skills

Adapted Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements:

1. I like my counterpart very much as a person.
2. My counterpart is the kind of person one would like to have as a friend.
3. My counterpart is a lot of fun to work with.
4. My counterpart defends my work actions to a superior, even without complete knowledge of the issue in question.
5. My counterpart would defend me to others.
6. My counterpart would defend me to others in the organization if I made an honest mistake.
7. I do work for my counterpart that goes beyond what is specified in my job description.
8. I am willing to apply extra effort, beyond what is normally required, to meet my counterpart's work goals.
9. I do not mind working my hardest for my counterpart.
10. I am impressed with my counterpart's knowledge of his/her job.
11. I respect my counterpart's knowledge and competence on the job.
12. I admire my counterpart's professional skills.

Platoon Member and Company Level Leader Scales

Co-Leader Effectiveness (General Leadership Impression Scale; Lord et al., 1984)

Original Item Wording

Instructions: The following questions concern your feelings towards and evaluations of GROUP MEMBER _____. Please circle the answer which reflects your feelings.

1. How much did this member contribute to the effectiveness of the task?
2. What degree of influence did this member exert in determining the final outcome of the task?
3. How much leadership did this member exhibit?
4. How much control over the group's activities did this member exhibit?
5. If you had to choose a leader for a new task, how willing would you be to vote for this member as leader?

Adapted Item Wording

Instructions: Please use the scale provided to rate the performance of the PLATOON LEADER AND PLATOON SERGEANT AS CO-LEADERS OF THE PLATOON:

1. How much do the/your co-leaders contribute to the effectiveness of the platoon's tasks?
2. How much influence do the/your co-leaders have together in determining the final outcome of the platoon's tasks?
3. How much leadership do the/your co-leaders exhibit together?
4. How much control over the platoon's activities do the/your co-leaders exhibit together?
5. If you had to choose leaders for a new task, how willing would you be to select the/your current co-leaders together?

Note. Adapted item wording "the/your" reflects different wording for the company level leader survey and subordinate platoon member survey, respectively.

Platoon Member Only Scale

Team Satisfaction/Viability (Team Satisfaction/Viability; Tesluk & Mathieu, 1999)

Original Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements about your team:

1. I really enjoy being a part of this team
2. I feel like I get a lot out of being a member of this team
3. I get along with the members of this team
4. I am very happy being part of this team
5. I would work with this team again in the future
6. I would want to work with a team that has mostly the same people
7. For future projects, I would hope to be with a similar team

Adapted Item Wording

Instructions: Please indicate the extent to which you agree or disagree with the following statements about your platoon:

1. I really enjoy being a part of this platoon.
2. I feel like I get a lot out of being a member of this platoon.
3. I get along with the members of this platoon.
4. I am very happy being part of this platoon.
5. If I could choose to, I would work with this platoon again in the future.
6. If I could choose to, I would want to work with a platoon that has mostly the same people.
7. If I could choose to, for future assignments, I would hope to be with a similar platoon.

Company-Level Leader Only Scale

Team Performance (Scale Created Internally for ARI)

Original Item Wording

Adapted Item Wording

Instructions: Please use the scale provided to rate the performance of the **PLATOON** (fill in the bubble corresponding to your response):

N/A

1. How would you rate the platoon's overall performance?
2. How would you rate the platoon on their performance in training events?
3. How would you rate the platoon's overall cohesion?
4. This platoon demonstrates a high level of overall mission readiness.
5. This platoon demonstrates a high level of overall military/operational effectiveness.
6. This platoon is well prepared to perform Mission Essential Task Lists (METLs).
7. This platoon is well prepared to perform its training missions.
8. This platoon performs better than most.
9. This platoon is not able to perform as well as it should.
10. This platoon is poor compared to other platoons with a similar mission.
11. This platoon performed well at most tasks in the last 30 days.

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14. ABSTRACT Co-leadership is becoming a more popular and prominent leadership structure across a variety of industries and settings; however, the body of knowledge on this topic is limited. Much of the current research focuses on whether co-leadership is a beneficial or detrimental form of leadership and there exists a gap in our knowledge about how and when co-leadership is or is not successful. The current study aims to fill this gap by surveying a group of 48 U.S. Army co-leader dyads and their direct superiors and subordinates on antecedents and outcomes of this co-leader relationship. Results demonstrate that engaging in effective co-leader processes such as participative decision-making, willingness to learn from each other, and supporting and empowering each other was related to higher quality co-leader relationships. Additionally, participative decision-making and communication quality were related to co-leader effectiveness. Results also revealed that each member of the co-leader dyad may view these antecedents of relationship quality differently. Further, positive co-leader processes and interactions were related to key outcomes such as co-leader effectiveness and team effectiveness. Unexpectedly, co-leader relationship quality was not related to co-leader effectiveness nor team effectiveness and level of dyadic congruence on these antecedent processes was not related to relationship quality. Overall, these findings suggest that co-leadership can work and provide preliminary evidence of antecedents of success and failure.							
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