March 2018

Manipulating Relative LMX: Effects on Performance, Conflict, and Strain

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by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Psychology
College of Arts and Sciences
University of South Florida

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Date of Approval:
March 22, 2018

Keywords: Leadership, leaders, teams, virtual, stress

DEDICATION

There are so many people responsible for the completion of my degree. First, and foremost, I want to thank my parents, Robyn and Tom Fletcher. They have always pushed me to be my best, and supported me throughout my crazy journeys. I know I can always turn to them for guidance, love, and support. Thank you. I cannot say it enough, thank you. Secondly, I want to thank my darling brilliant fiancée, life partner, and queen, Dr. Kimberly French for her support, encouragement, empathy, and insight. Thank you for being my rock, by number one fan, and a never-ending source of love and joy. I want to thank my grandparents Karen and Tom Fletcher, Loretta Jeanne and Jan Olson, Ron and Janet Matthews for always supporting me in any way they can. I want to thank my brother Nic, my sister-in-law, Kelsey and their amazing children Jaelynn, Kaylor, and Ryder for their support and for always being with me wherever I go. I also want to thank Drs. Wendy Bedwell, Jim Summers, Dan Johnson, Kristen Horgen, Chris Kubisiak, and Elizabeth Lentz for being outstanding mentors throughout my graduate career and for helping me find my place among academia. I would also like to thank Drs. Shane Lynch, Wythe Whiting, Bob Stewart, Karla Murdock, Julie Woodzicka, Megan Fulcher, Marcia France, Steven Walkley, and Leonard Jarrard for giving me amazing opportunities, and teaching me not only the content and skills but life-lessons that I would need to be successful in graduate school. Lastly, I want to thank my amazing friends. There are too many of you to count or name, but regardless of when or how we met, know that you have touched my heart and made this feat

possible. Every conversation, text, or facebook message helped keep me sane, and every late night work session at Starbucks, McDonalds, or the lab ept me productive. It really is true that it takes a village to raise a child. So thank you, to all of you, for helping me and being such meaningful parts of my life.

ACKNOWLEDGEMENTS

This specific piece of work would not have been possible without the direct help of many individuals. I would first like to thank the NIOSH training grant for your partial support of my graduate career. I would like to deeply thank my advisor and mentor Dr. Michael Brannick. Mike's insight and inspiration, not to mention tireless dedication, helped me complete this document and project in the ridiculously short time I set forth. I am so grateful for your mentorship and friendship. I would also like to thank my tireless group of research assistants: Medjine Jeanty, Wednesday Radke, Zackery Vaughan, Daniel Acosta-Florez, Lora Bishop, Bella Costanza, Danielle Crawford, Gabriela Cabrer Nazco, Elise Collins, Lauren Harrell, Nick Hernandez, Andrew Kimelman, Nelson larzabal Ruiz, Drausty Patel, Tricia Tran. This study would literally have not been possible without your assistance, and it certainly would have been less enjoyable without your presence. Thank you. Thank you as well to my committee members, Tammy Allen, Mike Braun, Kristen Salomon, and Joseph Vandello. You have all been mentors to me throughout my graduate career and it was fitting that we were able to finish this journey together. Thank you for your insightful comments, questions, and suggestions that helped to make this dissertation what it is. Here I must also again thank Dr. Kimberly French for her insight, for helping me multiple times when I was in a bind during data collection, for her aid with learning R, and for her suggestions (as well as Maryana Arvan's) in preparation for my defense. I could not have done this without you.

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ABSTRACT

Fundamental to the conceptualization of leader-membership exchange (LMX), particularly within the context of teams, is that leaders do not necessarily treat each follower equally. Studies that have examined LMX within the context of the team often fail to capture these complexities, or rely exclusively upon self-report, or survey-based data to make inferences. Therefore, it is the purpose of this study to examine the effects of experimentally manipulated relative LMX within teams on individual conflict processes, attitudes, and psychological distress, as well as team-level performance. This study examined conflict processes and outcomes within 113 virtual, project teams engaged in a decision-making task that required intensive interdependence. Teams were composed of three subordinates and a confederate leader who engaged in behaviors designed to heighten LMX with all, some, or none of the participants, depending on the condition. Results suggest that objectively manipulated leader behaviors influenced perceived levels of LMX as well as leader and teammate satisfaction, psychological distress, use of collaborative and individualistic conflict processes, and motivation to perform with the team. Results also indicate that relative LMX condition moderates the relationship between LMX condition and outcomes of interest, such that LMX condition has a stronger effect on outcomes when individuals are in a minority configuration (i.e., have a higher RLMX) than when they are in a shared configuration.

CHAPTER ONE:

INTRODUCTION

Leadership, like many constructs of interest in the workplace, does not occur in a vacuum. A leader, by definition, cannot exist without followers. Further, such followers share a common goal with the leader, must adapt to the conditions of performance, and are, to some extent, interdependent. By definition, then, leaders and followers create work teams (e.g., Salas, Dickinson, Converse, & Tannenbaum, 1992). Thus, in the context of work, proximal leadership cannot exist outside of the context of teams. And yet, one of the most prevailing theories of leadership, Leader-Member Exchange (LMX) Theory (e.g, Graen & Uhl-Bien, 1995) has often failed to be examined within the context of the team (Kozlowski, Mak, & Chao, 2016). Those studies that have examined LMX at the team level often fail to capture its complexities, or rely exclusively upon self-report, or survey-based data to make inferences (Kozlowski et al., 2016). Moreover, few studies are able to capture the initial development stages of LMX. The present study thus has two purposes. First, to link experimentally manipulated leadership behaviors with individual perceptions of LMX and to outcomes. Second, to tie experimentally manipulated differentiation of leadership behaviors within a team to individual conflict processes and psychological distress as well as individual and team performance.

Leadership

A prominent definition of leadership suggests that it is "the process (act) of influencing the activities of an organized group in its efforts toward goal setting and goal achievement"

(Stogdill, 1950, p. 4). Three defining characteristics of leadership emerge from this definition. First, leadership must take place within a group. Stogdill also highlighted the need for the group to have a shared task or goal, thus reflecting the definition of a team presented by Salas and colleagues (1992). In fact, the only differentiation between the prominent definitions of teams (e.g., "recurring cycles of mutually dependent interaction"; Morgeson, DeRue, & Karam, 2010, p. 7) and the groups of Stogdill's definition, is the necessity to adapt or to repeat interactions. Regardless, it is clear that leadership must occur within the context of mutually dependent interactions between at least two or more individuals.

The second key aspect of Stogdill's (1950) definition of leadership is the requirement that it be goal-oriented. It is the duty of the leader to organize and direct the attitudes, behaviors, and cognitions of others toward a united goal. This particular quality of leadership is echoed in a range of leadership theories (e.g., sense-making, sense-giving, planning, and goal-setting (Zaccaro, Rittman, & Marks, 2001); initiating structure (Fiedler & House, 1988; Stogdill, 1963); directive leadership (House & Mitchell, 1975); and vision provision and implementation (Bass, 1985)).

Lastly, leadership is marked by one's influence upon others in the group. Although this point is linked to that of occurring within a team, it focuses less on the context (i.e, the group) and more on the process (i.e., influence). The manner of influence is the subject of most leadership theories. *How* leaders convince other group members to buy into the shared vision and to expend effort toward the group's goals, potentially at the individual's expense, is the ultimate question that leadership theories try to address. Together, these three key points capture the leadership phenomenon ranging from the context in which leadership occurs, the purpose of leadership, and ultimately the methods leaders may use to pursue that purpose. To better

understand these three key aspects of leadership, particularly the method in which leadership results in outcomes, I first present a brief summary of the most prominent leadership theories.

Effective Leadership Behaviors

The purpose of leadership theories is to describe, predict, and explain effective leadership. One approach toward this goal is the examination of traits that make effective leaders. Research has supported genetic (e.g., Arvey, Rotundo, Johnson, Zhang, & McGue, 2006), cognitive (e.g., Hogan, Curphy, & Hogan, 1994), and personality (e.g., Bono & Judge, 2004; Lord, De Vader, & Alliger, 1986) predictors of perceived leadership behaviors. Intelligence, for example, has been meta-analytically linked to perceived leadership effectiveness, perceived leadership emergence, and most strongly, with objective effectiveness (Judge, Colbert, & Ilies, 2004). Extraversion and conscientiousness have both also been positively linked to leadership effectiveness (Judge, Bono, Ilies, & Gerhardt, 2002). Yet, purely trait-based approaches toward leadership fail to account for mediating mechanisms (Ng, Ang, & Chan, 2008). For example, the relationships between perceived leader effectiveness and extraversion, neuroticism, and conscientiousness were found to be mediated by leadership self-efficacy, particularly if leaders experienced low job demands (Ng et al., 2008). Further, the effects of neuroticism and conscientiousness were only mediated by leadership self-efficacy if leaders also had high levels of autonomy (Ng et al., 2008). Thus, to understand the role of the leader, one must understand not only qualities of the leader such as intelligence and personality, but also other aspects of leadership, like the leader's attitudes or behaviors.

Behavior-based approaches to leadership, then, provide a more nuanced understanding of leadership, pointing towards what effective leaders *do* rather than *who* are effective leaders. For example, a set of studies conducted at The Ohio State University (Stogdill & Coons, 1957)

provided the basis for one of the first behavior-based leadership theories, suggesting that leaders should participate in two particularly useful sets of behaviors (initiating structure and consideration) to enhance performance. Initiating structure encompasses the task-oriented aspects of leadership, such as defining roles and responsibilities, and consideration includes relationship-based requirements of leadership such as engendering trust and respect. Initiating structure and consideration have both been linked to follower job satisfaction, satisfaction with the leader, motivation, leader job performance, leader effectiveness, and group performance (Judge, Piccolo, & Ilies, 2004). Beyond consideration and initiating structure, however, more leader behaviors have been identified as particularly effective. Specifically, transactional and transformational leadership have garnered much attention within the leadership literature.

Although transactional leadership focuses on a formalized exchange between leaders and followers (Bass, 1985; Burns, 1978), transformational leadership encompasses a variety of behaviors that target the motivation of both the follower and leader as well as their interpersonal relationship. Transactional leadership behaviors are limited to self-serving exchanges between the leader and follower in which the leader's role is to ensure that the follower completes his/her tasks and obeys organizational policies. Transactional leadership may include use of contingent rewards and management-by-exception (use of negative reinforcement patterns). These behaviors have been linked to improved motivation, job performance, and effectiveness (Judge & Piccolo, 2004). Transformational leadership, on the other hand, is comprised of four specific sets of behaviors: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985). Idealized influence is akin to charismatic leadership (House, 1976) and essentially requires the leader to act as a role model for followers. Inspirational motivation includes setting high expectations and goals for followers. Intellectual

stimulation includes behaviors that encourage followers to learn, grow, and be creative. Lastly, individualized consideration includes behaviors of the leader that focus on the individual needs of followers. Each of these four behavioral categories have been positively linked with outcomes like perceived meaningfulness of work and improved job performance (Piccolo & Colquitt, 2006), along with follower job satisfaction, satisfaction with the leader, motivation, and organizational performance (Judge & Piccolo, 2004). The purely behavioral perspective of leadership, however, fails to account for the need to adapt based on situational context. Transformational leadership begins to address this issue by accounting for individualized attention, but still suggests that a particular set of leadership behaviors are optimal for all followers in all contexts.

In contrast with behavioral and trait-based approaches toward leadership, situational approaches suggest that the most effective behaviors differ based on qualities of the context. Path-goal theory (House & Mitchell, 1974), for example, identifies four sets of behaviors (directive, supportive, participative, and achievement-oriented) that may be more or less effective depending on the specific requirements of the task and follower. Directive behaviors, including provision of guidance and structure, are akin to initiating structure (Stogdill & Coons, 1957) and are thought to be particularly useful if the task is ambiguous or complex and the follower has a high need for structure. Supportive behaviors are similar to consideration (Stogdill & Coons, 1957) and focus primarily on the physical and emotional well-being of followers. House and Mitchell (1974) suggest that supportive behaviors are particularly useful if the task is repetitive and boring and the follower has a high need for affiliation or is unsatisfied in the current situation. Participative behaviors include those designed to elicit information and engagement from followers, making them feel consequential in decision making and task

progression. Such behaviors are thought to be particularly useful if the task is unclear, a path for goal-achievement is not readily identified, and if the follower has a high need for autonomy and control. Finally, achievement-oriented leadership behaviors are similar to those identified by the inspirational motivation dimension of transformational leadership. Leaders engaging in these behaviors set challenging goals for followers, provide encouragement, and display confidence in the followers' abilities to achieve these goals. This set of behaviors is thought to be particularly useful if the follower has a high need to achieve and if the task is particularly challenging or complex. Although empirical support for the entirety of path-goal theory is lacking, partly due to the high number of contextual factors that need to be considered (House, 1996), links between the individual behaviors and performance and other outcomes of interest have been established and mirror those findings from behavioral approaches to leadership. For example, Malik, Aziz, and Hassan (2014) linked the four behavioral approaches to followers' willingness to accept a leader's directions. In the same study, the authors separately linked aspects of the situation, like role ambiguity, task structure, and need for achievement, with the willingness to accept a leader's directions. This supports the notion that leader behaviors are linked to outcomes of interest, and these links may depend on situational variables. However, even situational approaches to leadership fail to explicitly address the team context in which leadership occurs. Leader-membership exchange (LMX), on the other hand, addresses this important contextual factor.

Leader-Member Exchange

Unlike other popular leadership theories, LMX theory focuses on the *relationship* between the leader and each follower, not specifically any one behavior (Dansereau, Graen, & Haga, 1975; Graen, Novak, & Sommerkamp, 1982; Schriesheim, Castro, & Cogliser, 1999).

LMX is typically conceptualized as the quality of the relationship between the leader and the follower. Each relationship is rooted within a larger set of linkages between the leader and each follower within the team (Schriesheim et al., 1999). Fundamental to this conceptualization of leadership is that leaders do not necessarily treat each follower equally (Schriesheim et al., 1999). This understanding therefore suggests that leadership models focusing on average leadership styles fail to capture the nuances of the interdependent dyadic relationships established between the leader and each follower. Further, by acknowledging the potential differential treatment of followers, LMX theory allows for the creation of an in-group and an out-group among followers. LMX theory asserts that a leader develops high quality relationships with a subset of followers, creating an in-group, and engages in lower quality relationships with other followers, thereby creating an out-group (e.g., Dansereau et al., 1975). Relationships between the leader and followers within the in-group are theoretically marked by role negotiation (Dansereau et al., 1975) including increased responsibilities and challenging or developmental assignments (Boies & Howell, 2006), but also by support, encouragement (Boies & Howell, 2006), respect (Graen & Uhl-bien, 1995), and loyalty (Liden & Maslyn, 1998). These qualities tend to be in line with the effective behaviors (e.g., inspirational motivation; Bass, 1985; achievement-oriented leadership; House & Mitchell, 1974) outlined by behavioral and situational approaches toward leadership. Relationships between the leader and the followers in the out-group are instead theoretically marked simply by the completion of contractual obligations (Dansereau et al., 1975) in a pattern that looks similar to initiating structure (Stogdill & Coon, 1957), or Bass's (1985) transactional leadership.

In its original conceptualization, LMX theory suggested that having differential relationships with followers was natural and perhaps beneficial to leaders (Dansereau et al.,

1975), but this understanding changed. LMX theory became more prescriptive, suggesting that leaders should strive to develop high LMX with all subordinates (Graen & Uhl-Bien, 1995; Yukl, O'Donnell, & Taber, 2009). Gerstner and Day (1997), and later Dulebohn and colleagues (2012), established meta-analytic support for the benefits of high levels of LMX such as follower performance, overall job satisfaction, organizational commitment, and satisfaction with the leader. Yet, as a prescriptive theory, LMX does little to provide leaders with information on *how* to create high levels of LMX with followers. Dulebohn and colleagues (2012) found relatively fewer studies examining the antecedents of LMX compared to those examining outcomes. Further, of those antecedents with enough research to be meta-analytically examined, the only leadership behaviors examined were contingent reward behavior and transformational leadership, both of which showed significant correlations with LMX (ρ = .73, Credibility Interval$_{80\%}$ = [.51, .96] and [.49,.97], respectively). LMX quality was found to partially mediate the meta-analytic relationship between contingent reward behavior and all outcomes of interest (turnover intentions, organizational citizenship behavior (OCB), job performance, organizational commitment, job satisfaction, satisfaction with the supervisor, perceived procedural justice, and perceived distributive justice).

Despite the meta-analytically supported relationships between LMX quality and certain leadership behaviors (e.g., transformational leadership), no study has examined the objective leadership behaviors that lead to LMX. Of the smaller subset of studies that do examine behavioral antecedents of LMX quality, leadership behaviors are either reported by subordinates (e.g., O'Donnell, Yukl, & Taber, 2012; Yukl, et al., 2009) and are thus impossibly tangled with perceptions of LMX quality, or are reported in an average-leadership-style by supervisors or other subordinates (e.g., Wang, Law, Hackett, Wang, & Chen, 2005), thus violating the basic

assumption of LMX theory that each follower may form a different relationship with the leader. For continued use of LMX as a prescriptive theory, it is absolutely necessary to link objective leader behaviors to LMX quality. Given the empirical work linking perceptions of leader behaviors like supporting, delegating, and leading by example (O'Donnell et al., 2012) to perceptions of LMX quality, I hypothesize:

(1) Individual perceptions of LMX quality will be higher when a leader engages in behaviors theoretically consistent with high LMX.

LMX and Attitudinal Outcomes

As previously mentioned, a wealth of literature exists linking perceived LMX quality to a variety of outcomes, particularly satisfaction outcomes. The quality of the relationship between the leader and follower has been linked to increased overall job satisfaction, satisfaction with the leader, and organizational commitment (e.g., Dulebohn et al., 2012). Evidence suggests that LMX quality mediates the relationship between perceptions of leader behaviors and these satisfaction outcomes. However, these findings are still plagued by the empirical issues mentioned above, in which perceptions of leader behaviors and perceptions of one's relationship with the leader are inherently confounded. Even if efforts are made to evaluate leaders' behaviors using a secondary source like a supervisor or peer, this still falls into the fallacy of assuming an average-leadership style, which stands in contrast to the assumptions of LMX theory. It is therefore necessary to find empirical evidence linking objective leader behaviors directed toward each follower, individually, with each followers' satisfaction outcomes. Given the empirical and theoretical support that does exist, I hypothesize:

(2) Individual satisfaction with the leader will be higher when a leader engages in behaviors theoretically consistent with high LMX.

Inherent to the theory of LMX is that leader-member exchanges occur within work groups or teams. It then follows, particularly in line with vertical-dyadic linkages theory (the origin of LMX, Dansereau et al., 1975) that the quality of one's relationship with the leader may influence one's attitudes toward peers. Graen and Uhl-Bien (1995) suggested that high levels of LMX are also marked by the follower's interest in the team and team outcomes, indicating that one's relationship with the supervisor may influence one's expectations and satisfaction with one's teammates. Empirically, evidence suggests that a leader's average LMX with followers is a significant and positive predictor of followers' satisfaction with coworker relations (Erdogan & Bauer, 2010). Similarly, evidence (Hu & Liden, 2013) suggests that perceptions of LMX are positively correlated with team identification (one's emotional bonding with the team), and team-level LMX is positively related to team supportive behaviors (e.g., the provision of assistance, recognition, and cooperation). These findings echo those of Le Blanc and Gonzáles-Romá (2012) which suggested that the median level of LMX within a team is positively correlated with affective commitment to the team and negatively correlated with perceived dissimilarity. But again, these findings all fail to account for the leadership behaviors that lead to LMX quality, and the results are often confounded by potential single-source bias. Given the above evidence, I hypothesize:

(3) Individual satisfaction with the teammates, in general, will be higher when a leader engages in behaviors theoretically consistent with high LMX with the respondent.

Beyond satisfaction outcomes, LMX has also been linked to a variety of behavioral and attitudinal outcomes associated with stress processes. Meta-analytic results (Dulebohn et al., 2012) suggest that LMX is negatively associated with indicators of behavioral stress responses like turnover intentions and actual turnover, as well as indicators of psychological stressors like

perceived role ambiguity, perceived role conflict, perceptions of procedural and distributive justice, and perceptions of politics. Primary empirical support also suggests that LMX is negatively associated with role stress and burnout (Thomas & Lankau, 2009). Average LMX within the team has also been negatively linked to outcomes like turnover intentions (Harris, Li, & Kirkman, 2014). Perceptions of LMX quality have also been positively linked with psychological resources like empowerment (Dulebohn et al., 2012), perceived organizational support (Epitropaki & Martin, 2013), self-efficacy (Liao, Liu, & Loi, 2010) and positive psychological outcomes like role engagement (Li & Liao, 2014). Yet, all of these findings still fail to adequately link the leader's behaviors to the outcomes of interest or even perceptions of LMX. Many, too, are plagued by common method variance with perceptions of stressors, stress responses, and LMX quality all provided by the same source. Therefore, to clarify the utility of leaders' attempts to establish high LMX relationships with followers, in line with the frequently used prescriptive application of LMX theory, it is necessary to establish an empirical link between leader LMX behaviors and follower strain outcomes. Given the above findings, I hypothesize:

(4) Individual psychological distress will be lower when a leader engages in behaviors theoretically consistent with high LMX.

LMX and Conflict

Given that LMX occurs within teams, it is important to understand the relationship between LMX and the behaviors among teammates. Marks, Mathieu, and Zaccaro (2001) outlined a taxonomy of processes within teams, suggesting that team processes can be action-oriented, transition-oriented, or interpersonally-oriented. Action processes are task-oriented behaviors that occur during action phases of performance cycles and help teams achieve

overarching goals by completing tasks (Marks et al., 2001). Transition processes are task-oriented behaviors that occur between action phases of performance cycles, and help teams analyze previous performance and plan and prepare for upcoming action phases (Marks et al., 2001). Interpersonal processes, however, occur throughout action and transition phases, and are team-oriented behaviors that help organize the individual knowledge, skills, abilities, and attitudes of team members. Interpersonal processes include conflict management, motivation and confidence building, and affect management. Given their ubiquitous nature, interpersonal processes may hold great implications for individual and team outcomes. For teams in which LMX may be unequally distributed, it is particularly important to examine the role of conflict and conflict management.

Conflict within teams has long been examined as either task-based or relationship-based (DeChurch, Mesmer-Magnus, & Doty, 2013). Task-based conflict is thought to focus on disagreements about how to achieve shared team goals, while relationship-based conflict focuses more on interpersonal disagreements and challenges (e.g., De Dreu & Weingart, 2003; De Wit, Greer, & Jehn, 2012). Research suggests that relationship-conflict has negative outcomes for individuals and the team, but are less conclusive regarding the impact of task-conflict. Some (De Dreu & Weingart, 2003) have suggested task-conflict rarely has positive outcomes for teams, likely due to its effects bleeding over into interpersonal conflict. Others (De Wit et al., 2012) have suggested that task-conflict may have positive effects in specific circumstances, particularly if it can be isolated from interpersonal conflict. De Church and colleagues (2013), however, suggested that for improved explanatory power, researchers must shift their attention from purely relationship- versus task-based conflict, toward an understanding of conflict processes, akin to conflict management processes (Marks et al., 2001).

Although task- and relationship-based conflict may be emergent states (De Church et al., 2013), conflict (management) processes are, by definition, processes and can potentially better help explain how teams convert inputs to outputs (De Church et al., 2013). De Church and colleagues (2013) outlined four types of conflict processes broken into two domains: collectivistic versus individualistic. Collectivistic conflict processes include openness and collaborating (De Church et al., 2013). Openness, as a conflict process, represents a change-oriented approach toward discussion that prioritizes mutual benefit over individual gain (De Church et al., 2013; Tjosvold, 1985). Collaborating, on the other hand, represents the notion of *moving toward* (De Dreu & Van Vianen, 2001), in which participants work together, compromising and reaching a shared understanding that is mutually beneficial. So, while openness represents dialogue in which participants discuss and fairly evaluate various potential paths of progression and select one, collaboration represents discussions in which participants work together, compromising individually preferred paths for a shared, common ground option. Although collectivistic conflict processes require participants to value team-level goals, individualistic conflict processes (avoiding and competing) focus more on individual goals (De Church et al., 2013). Avoiding, as a conflict process, focuses on preservation of one's personal comfort by *moving away* from conflict (e.g., De Dreu & Van Vianen, 2001). Competing, on the other hand, is more about preservation of one's personal goals by *moving against* others' wishes during conflict and advocating one's own priorities (e.g., De Dreu & Van Vianen, 2001). Overall, collectivistic conflict processes are those that show concern for the team as the whole, and individualistic conflict processes are those that show a primary concern for the individual (De Church et al., 2013). This distinction echoes the implications of high versus low LMX (Graen & Scandura, 1987), which suggest that at high levels of LMX, members should be

primarily concerned with group-level outcomes, while at low levels of LMX, members are primarily focused on individual-level outcomes. Therefore, I hypothesize:

(5a) Individuals experiencing high levels of LMX behaviors will engage in higher levels of collectivistic conflict processes compared to their peers who experience low LMX.

(5b) Individuals experiencing low levels of LMX behaviors will engage in higher levels of individualistic conflict processes compared to their peers who experience high LMX.

LMX and Performance

Beyond attitudinal outcomes, LMX quality has often been examined as a predictor of performance. Meta-analytic evidence supports a small to medium effect of LMX quality on individual task performance (ρ = .34, Credibility Interval$_{80\%}$ = [.11, .56]) and OCBs (ρ = .39, Credibility Interval$_{80\%}$ = [.20, .58]; Dulebohn et al., 2012). Dulebohn and colleagues (2012) suggested that LMX quality partially mediates the relationship between leader behaviors (e.g., contingent reward behavior) and job performance as well as OCBs. Despite this meta-analytically supported relationship between LMX quality and performance, the exact mechanism remains elusive. This could be, in part, due to the theoretical and methodological issues associated with measuring LMX and performance. Specifically, most LMX studies are cross-sectional examinations of intact relationships (Dulebohn et al., 2012) which limits the understanding of how performance and LMX are causally linked. Specifically, the question remains, is it that leaders create higher levels of LMX with high performers or do individuals who have high levels of LMX with the leader perform better? Graen and Uhl-Bien (1995) suggest that it is perhaps mixed causality, such that during initial development of LMX in the field, leaders provide opportunities to perform to all followers, and then pursue high levels of LMX with those who perform best. Then, through the creation of high LMX, individuals develop

skills and motivation toward achieving goals set by the leader. This nuanced understanding, however, cannot be tested with many of the current study designs. Those that have attempted to use cross-lagged data collection (e.g., Li and Liao, 2014; Naidoo, Scherbaum, Goldstein, & Graen, 2011), or data collection among nascent teams (e.g., Liden, Wayne, & Stilwell, 1993) have found a significant link between LMX and performance, such that LMX seems to predict performance, but because LMX has not been experimentally manipulated, there is a number of potential explanations for this. One such explanation is that leaders may be able to identify potential high performers and create high expectations of these individuals, which then leads to high levels of LMX. This relationship has been, to some extent, meta-analytically supported (Dulebohn, et al., 2012). Therefore, it is necessary to determine whether behaviors designed to create high levels of LMX alone result in improved performance as theory and empirical findings would suggest. Thus, the current study focuses on manipulated LMX behaviors within newly formed teams. I hypothesize:

(6a) Individuals experiencing high levels of LMX will have higher levels of individual performance than their peers who experience low LMX.

Again, it is important to keep in mind that LMX does not occur within a vacuum, and that dyadic relationships between a leader and follower are formed within a team or work group. As such, there has been a handful of primary studies examining team-level LMX and team-level performance. Granted, this understanding takes an average leadership-style approach toward studying LMX, and thus fails to fully account for the phenomenon of differential levels of LMX within a team, but findings do consistently support a link between average-level LMX and team performance (e.g., Le Blanc & González-Romá, 2012; Liden, Erdogan, Wayne, & Sparrowe, 2006; Stewart & Johnson, 2009), creativity (Pan, Sun, & Chow, 2012), and team-level processes

like innovation (e.g., Gajendran & Joshi, 2012). In a longitudinal study of LMX at the team level, Naidoo and colleagues (2011) found evidence to suggest that early levels of LMX within the team did not predict final team performance, but later levels of LMX within the team were significant predictors. This could be due to the slow, natural development of LMX or an issue of temporal proximity of measurement, such that later measures of LMX were more indicative of LMX levels when final performance was captured. Thus, given the relatively consistent link between average LMX within the team and team performance, I hypothesize:

(6b) Teams with more individuals experiencing high levels of LMX will perform better.

Relative LMX

Beyond the effects of the quality of one's relationship with his/her leader, it is crucial to understand the relative quality of that relationship in the context of the team/unit as a whole. Rooted in the original conceptualization of LMX is the notion that the leader can create relationships of differing qualities with subordinates (e.g., Graen & Scandura, 1987; Henderson et al., 2009; Liden & Graen, 1980). Some suggested that leaders should strive to have high levels of LMX with all followers, and accept that there may not be enough resources to do so, thus creating an out-group of individuals with low-quality LMX relationships (e.g., Graen & Uhl-Bien, 1995). Others suggested that engaging in differential qualities of relationships with followers within the same unit may actually be damaging. Most research into the effects of LMX differentiation (e.g., Hu & Liden, 2013) draws on social comparison theory (e.g., Goodman, 1977; Greenberg, Ashton-James, & Ashkanasy, 2007). These investigations suggest that individuals compare the quality of their relationship with the leader to the quality of the relationships their peers have with the same leader. Hu and Liden (2013) suggested that one's standing in LMX quality in relation to other subordinates, also called relative LMX (RLMX),

may signal to the follower their leader's perceptions of his/her abilities in comparison to other peers. RLMX is often calculated mathematically, by determining the deviation of one's reported LMX from the average LMX reported by the team. Hu and Liden (2013) found that RLMX, calculated in this way, was significantly and positively related to self-efficacy which mediated the relationship between RLMX and individual performance, OCBs, and job satisfaction. This suggests that it is not only the quality of the relationship but also one's standing in comparison to peers that predicts outcomes of interest. Similarly, Pan and colleagues (2012) found a significant positive relationship between RLMX and psychological empowerment. In a more direct examination of this notion, LMX social comparison was explicitly measured with items such as *"I have a better relationship with my manager than most others in my work group"* (Vidyarthi, Liden, Anand, Erdogan, & Ghosh, 2010, p. 853) rather than RLMX which relies on relative standing and assumes social comparison follows. LMX social comparison was found to be positively related to LMX, job performance, and OCBs (Vidyarthi et al., 2010). Further, it was found that LMX social comparison fully mediated the relationship between RLMX and OCBs and partially mediated the relationship between RLMX and performance, thus supporting the idea that social comparison is an active mechanism in the context of LMX within teams (Vidyarthi et al, 2010). It should be noted, however, that "past research largely supports that LMX differentiation does not directly influence follower outcomes, but instead interacts with other LMX constructs (e.g., individual LMX) to influence follower outcomes" (Harris et al., 2014, p. 316). This suggests, then, that examining RLMX in isolation may be missing part of the story.

At the team level, LMX differentiation, the amount of variation in LMX within the team (Stewart & Johnson, 2009), has been mathematically calculated using within-group correlations

(r_{wg}s), inctraclass correlation coefficients (ICCs), or standard deviations. Regardless of the calculation method, LMX differentiation has been found to moderate the relationship between average levels of LMX quality and outcomes of interest. Specifically, in teams where the there is a wider range in the quality of LMX relationships (i.e., high level of differentiation), the average level of LMX within the team is a stronger predictor of team conflict and team potency (Boies & Howell, 2006) than in teams in which the LMX qualities tend to be more similar. Further, research suggests that as differentiation increases, the relationship between LMX and leader-rated individual performance strengthens (Ma & Qu, 2010). On the other hand, evidence suggests that as LMX differentiation decreases, the relationship between average LMX and outcomes like turnover intentions, OCBs (Harris et al., 2014), team commitment, and team performance (Le Blanc & González-Romá, 2012; Liden et al., 2006) strengthens.

However, above and beyond the amount of variation of LMX within the team, or an individual's relative standing on LMX within the team, it is suggested that the configuration of LMX must be considered (Li & Liao, 2012). Specifically, four types of LMX dispersion configuration have been posited: shared, minority, bimodal, and fragmented. Shared LMX configuration occurs when all individuals have roughly equal levels of LMX. Minority configuration occurs when most individuals have the same level of LMX but a small portion have a drastically different level. Bimodal LMX configuration occurs when there are two, relatively equally sized subgroups within the team that experience drastically different levels of LMX. Lastly, fragmented LMX configuration occurs when nearly all members of the team receive substantially different levels of objective LMX quality. Results suggest teams with bimodal or fragmented LMX experience worse coordination, and ultimately performance, than teams with shared LMX configurations (Li & Liao, 2012). The authors suggested that this

pattern is indicative of in-group/out-group dysfunctional dynamics. Evidence regarding the differences between a minority configuration and a shared configuration was weak, however, potentially due to the nature of data collection. In fact, studies examining the effects of RLMX, LMX differentiation, or LMX configuration are plagued by the same methodological issues as those examining the main effects of LMX; they often rely on survey-based, cross-sectional data collected from in-tact teams. This once again fails to account for the inherent link, but undetermined causality, between outcomes of interest like performance or satisfaction and LMX. In fact, Li and Ye (2015) called for stronger causal evidence linking RLMX to outcomes, and for better measurement of RLMX. Thus, it is necessary to examine the effects of experimentally manipulated RLMX on outcomes of interest, particularly within newly formed teams, to better tease apart these relationships, and to be able to truly speak to causality.

The present study seeks to do so by experimentally manipulating leader behaviors directed toward subordinates within newly formed teams. The current study was designed such that within teams with a shared LMX configuration, leaders engaged in roughly equivalent behaviors with all subordinates to establish roughly equal levels of LMX, thus experimentally minimizing RLMX. Subordinates in these teams may have experienced either high or low LMX but experienced the same level of LMX as their two peers, and thus experiencing near zero RLMX. In teams with a minority configuration, the leader engaged in behaviors consistent with either high or low LMX with the majority of subordinates, while engaging in behaviors consistent with the opposite end of LMX quality with the minority. Within these teams, individuals may have experienced either high or low LMX, but if they were in the majority, they experienced the same LMX as one of their peers, while if they were in the minority, they were alone in their experience. Thus, within these teams, RLMX was manipulated to be of high

magnitude. In the current study, then, the magnitude of RLMX is operationalized as the number of individuals experiencing a level of LMX different from one's own. This experimentally manipulated RLMX is positive if one's teammates are experiencing lower levels of LMX than oneself, and is negative if the teammates are experiencing higher levels of LMX than oneself. Based on previous research that defined RLMX mathematically, I expect to find a similar pattern of relationships with this experimental operationalization of RLMX. With regard to satisfaction, the literature suggests that RLMX is positively correlated with perceived organizational support (Epitropaki & Martin, 2013), perceived psychological contract fulfillment (Henderson, Wayne, Shore, Bommer, & Tetrick, 2008), general job satisfaction (Hu & Liden, 2013), social identification (Tse, Ashkanasy, & Dasborough, 2012), and affective commitment (Li & Ye, 2015). Although, to the author's knowledge, no studies have examined RLMX as a moderator, many have examined the effects of LMX differentiation as a moderator, finding that the relationship between LMX and outcomes like OCBs, turnover intentions (Harris et al., 2014), and perceived insider status (Zhao, Kessel, & Kratzer, 2013) are weaker if LMX differentiation is high. Based on these findings, one would expect that the relationship between LMX and outcomes of interest would be weakened as the magnitude of RLMX increases. Therefore, I hypothesize:

> *(7) RLMX will moderate the relationship between LMX level and satisfaction with the leader, such that the relationship between one's LMX level and one's satisfaction with the leader will be weaker as the magnitude of RLMX increases.*
>
> *(8) RLMX will moderate the relationship between LMX level and satisfaction with teammates, such that the relationship between one's objective LMX level and one's satisfaction with teammates will be will be weaker as the magnitude of RLMX increases.*

Although they did not examine the moderating effect of RLMX, Hooper and Martin (2008) found LMX variability to be negatively related to well-being and job satisfaction, and positively related to team conflict. To understand how RLMX and LMX may interact to predict individual strain outcomes, one must first consider the social comparison aspect of RLMX, and the potential attributions followers will make about their own and others' abilities and performance based on the social information available to them (Festinger, 1954; Hu & Liden, 2013). If all individuals within a team are experiencing similar levels of LMX (zero RLMX), they may attribute their relationship with the leader to the leader's disposition. This should buffer the negative effects of low LMX while potentially mitigating the positive effects of high LMX. If, however, there are unequal levels of LMX within the team, individuals will have more information upon which to make attributions. Individuals should see that their leader does not have high LMX with all followers, and may then ascribe the cause of these differences to the most salient explanation, the followers themselves. This should then enhance the negative effects of low LMX, by increasing the likelihood of an internal attribution of the negative relationship (Hu & Liden, 2013). Within this context, those with high LMX should have increased internal attribution for the positive relationship and thus experience more positive outcomes (Hu & Liden, 2013). One could argue that uncertainty regarding the stability of the high LMX relationship with the leader, or the mere presence of a lower level LMX relationship, may act as a stressor due to perceived inequities or injustice (Li & Ye, 2015). This should be particularly salient if perceived differences in LMX are not clearly linked to ability, performance, or behavior. According to social comparison theory (Festinger, 1954), however, the follower will be more likely to attribute others' low LMX relationships with the leader to problems with those

followers. Therefore, the relationship between LMX and individual strain outcomes should be stronger as the magnitude of RLMX increases. Therefore, I hypothesize:

(9) RLMX will moderate the relationship between LMX level and psychological distress, such that the relationship between one's LMX level and one's psychological distress will be stronger as the magnitude of RLMX increases.

In addition to moderating the relationship between LMX and satisfaction as well as psychological distress, there is theoretical support to suggest that RLMX should moderate the relationship between one's LMX quality and the choice of conflict processes one uses. Specifically, evidence suggests that RLMX is positively related to rational upward influence tactics (the use of data and facts to support a logical argument) and negatively related to hard upward influence tactics (e.g., challenging others' authority, forming coalitions, or direct confrontation; Epitropaki & Martin, 2013). More specifically, the authors found that RLMX moderated the relationship between the level of transformational leadership and the use of upward influence tactics. It is unlikely, however, that the effects of RLMX on interpersonal behaviors are limited solely to upward influence tactics, particularly within the context of a team. LMX differentiation has been shown to have a main effect on conflict within the team (Hooper & Martin, 2008) and also to moderate the relationship between average LMX and the amount of conflict within the team (Boies & Howell, 2006). It has further been shown to relate to the amount of within-group disagreement (Ford & Seers, 2006). Therefore, it is pertinent to explore RLMX as a moderator of the relationship between one's LMX quality and the use of different conflict processes. Specifically, collectivistic processes, that prioritize the team over the individual, should be more likely to occur if an individual shares their high LMX status with others, given the ability for RLMX to create perceived similarity and in-group/out-group status

(e.g., Harris et al., 2014; Li & Liao, 2014). Similarly, if individuals are in the minority within the team, and do not share their objective low LMX quality with others, they may be more likely to engage individualistic conflict processes, which prioritize the self over the team. Further, in line with conservation of resources theory (Hobfoll, 1989), individuals who do not receive the support and social resources associated with high LMX may be particularly motivated to protect their psychological well-being and resources when their dearth of support is poignant (i.e., their RLMX is high). Alternatively, due to the presence of a downward social comparison (Wills, 1981), those with high RLMX may be aware of the social-emotional resources (e.g., leader support) associated with their high LMX status. In line with job demands-resources model (Bakker & Demerouti, 2007), these individuals may be particularly motivated to engage with the task by capitalizing upon their resources to address the demands of conflict in a way that maximizes team performance. Therefore, I hypothesize:

(10a) RLMX will moderate the relationship between LMX level and individualistic conflict processes, such that the relationship between one's LMX level and the use of individualistic conflict processes will be stronger as the magnitude of RLMX increases.

(10b) RLMX will moderate the relationship between LMX level and collectivistic conflict processes, such that the relationship between one's LMX level and the use of collectivistic conflict processes will be stronger as the magnitude of RLMX decreases.

In addition to moderating the relationship between LMX and attitudes and interpersonal behaviors, RLMX should moderate the effects of LMX on individual performance. Empirical evidence suggests a clear link between perceived RLMX and individual performance (e.g., Hu & Liden, 2013; Tse et al., 2012). Further, individuals who make internal attributions for the relationship quality with the leader because their RLMX is non-zero may then experience a self-

fulfilling prophecy. Those with low LMX who attribute the status of the relationship to internal qualities may believe that they are truly incapable of completing the task successfully, or that their individual performance does not matter, and thus they fail to perform to their maximum ability in an individual setting. Those with high LMX who attribute the status of the relationship to internal qualities because of a non-zero RLMX may believe they are highly capable of completing the task successfully, or that their individual performance will have implications for the team in the future, and thus they will be motivated to perform to their maximum ability in an individual setting. Therefore, I hypothesize:

(11a) RLMX will moderate the relationship between LMX level and individual performance, such that the relationship between one's LMX level and one's performance will be stronger as the magnitude of RLMX increases.

Further, given the consistent role LMX differentiation plays as a moderator in the relationship between average LMX and group performance, one would expect manipulated LMX configuration to behave similarly. For example, Le Blanc and González-Romá (2012) found evidence to suggest that although median LMX had a strong positive relationship with team performance, that relationship was moderated by LMX differentiation, such that as LMX differentiation increased, the relationship between median LMX and team performance weakened. These findings are echoed by the results of other studies (e.g., Harris et al., 2014; Liao et al., 2010; Liden et al., 2006) which all suggest that the benefits of high average LMX are only particularly pronounced when LMX differentiation is low. As such, one would expect a team comprised of followers all experiencing high LMX to perform better than teams in which even just one follower has a low LMX relationship. Further, these findings suggest that there

may be no differences in team performance between teams in which the majority has high LMX and those in which the majority has low LMX. Therefore, I hypothesize:

(11b) LMX configuration will moderate the relationship between average LMX and team performance such that:

(i) Teams with a shared configuration and low LMX (all followers have low LMX) will perform worse than all other teams

(ii) Teams with a shared configuration and high LMX (all followers have high LMX) will perform better than all other teams

(iii) Teams with a minority configuration will have equivalent performance levels.

The Present Study

This study (Figure 1) addresses three main questions that are unresolved in the literature. First, I sought to manipulate LMX conditions through leader behavior in newly formed teams, thus removing the conflation between perceived LMX, RLMX, and their correlates. By experimentally manipulating average LMX and LMX configuration within newly formed teams, this study allows for a clearer understanding of the true, causal nature these relationships, without the systematic error introduced by shared method bias. Second, to hone in on the effects of RLMX, this study compares outcomes within mixed LMX configurations to those within shared LMX configurations (Li & Liao, 2014). Third, this study examines the roles of LMX and RLMX in predicting different conflict processes highlighted by De Church and colleagues (2013). This study addresses the nature of these relationships in ad hoc, intensive, interdependent (Bell & Kozlowski, 2002), virtual (Gibson & Gibbs, 2006; Kirkman & Mathieu, 2005), project (Sundstrom, McIntyre, Halfhill, & Richards, 2000) teams.

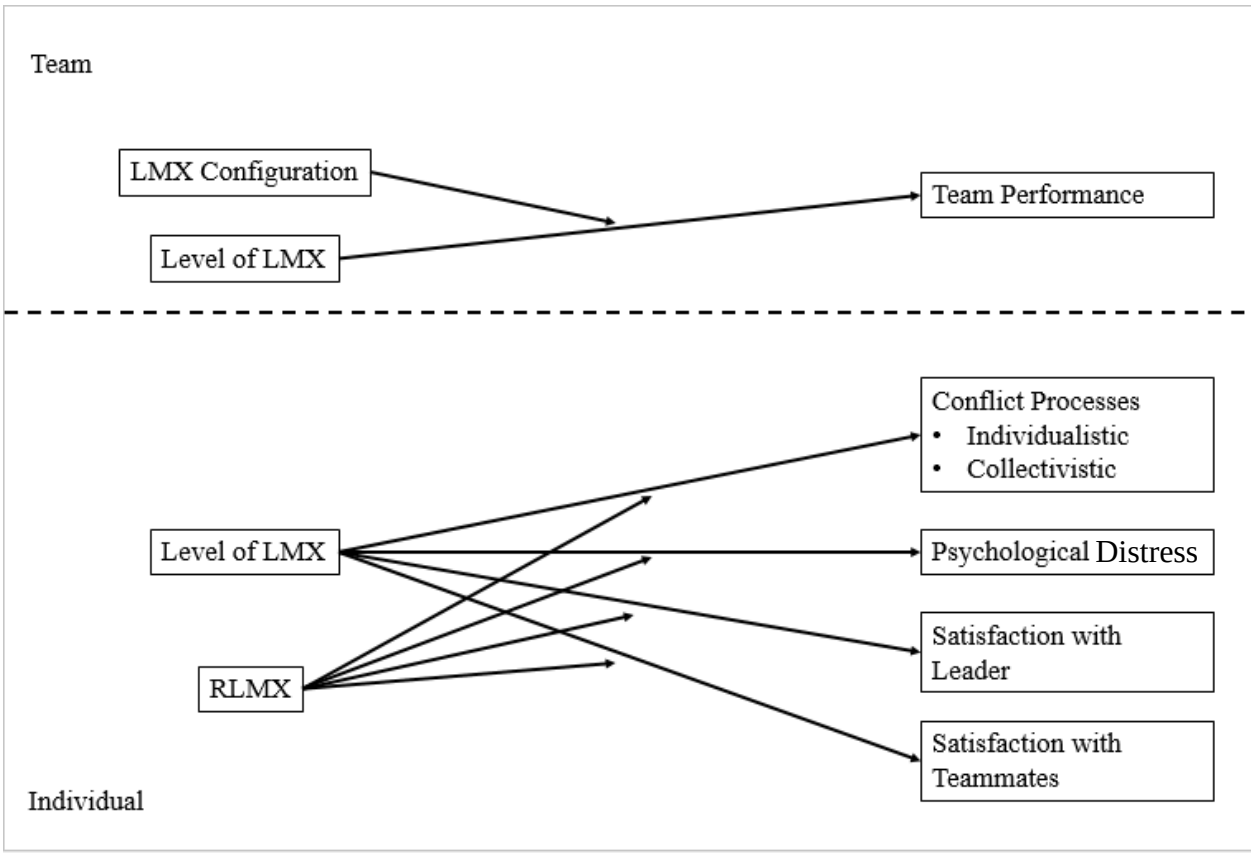

Figure 1. Theoretical model of LMX, conflict processes, and outcomes.

CHAPTER TWO:

METHOD

This study examined conflict processes and outcomes within newly formed, virtual, project teams (Sundstrom et al., 2000) engaged in a decision-making task that required intensive interdependence (Bell & Kozlowski, 2002). It is worth noting that while some scholars do not differentiate between groups and teams (e.g., Kozlowski & Bell, 2003; Sundstrom et al, 2000) others suggest that teams are groups of individuals working toward a shared goal in a manner in which the final product is a representation of both individual and collective input (Katzenbach & Smith, 1993). The task used in this study requires both individual and collective input to reach a shared goal, thus ensuring that the leadership phenomena being studied are truly occurring within a team. The entire procedure is quite similar to that of Balthazard, Waldman, and Warren (2009) which focused on decision-making teams, in which individuals first made ethical decisions alone, then discussed with their team to come to a consensus that the entire team accepted. They, too, argued that this type of task requires intensive interdependence within a team. Further, because participants were asked to complete a time-limited task and disband after task completion, these teams fall in line with Sundstrom and colleagues' (2000) definition of project teams (i.e, "project teams carry out defined, specialized, time-limited projects and disband after finishing" p. 46). Lastly, because the participants worked together in real time, to problem solve as a team, Bell and Kozlowski's (2002) definition of intensive interdependence (i.e., "team members must diagnose, problem solve, and/or collaborate simultaneously as a team to accomplish their task" p., 19) applies.

Teams were composed of three subordinate participants and a confederate leader who engaged in behaviors designed to heighten LMX with all, none, or some of participants, depending on the condition (Figure 2). Leader behaviors were scripted (Appendix A) and were executed using an online chat function. In order to create different levels of average LMX and RLMX, there were four team-level conditions, resulting in six individual-level conditions. Teams engaged in two performance cycles, the first of which allowed participants to acclimatize to the task and also to gain a sense of their LMX standing, and the second was the experimental performance cycle in which variables of interest were measured.

		LMX Differentiation	
		Shared LMX Configuration	Minority LMX Configuration
Average LMX	High	All high LMX No low LMX	Two high LMX One low LMX
	Low	No high LMX All low LMX	One high LMX Two low LMX

Figure 2. Four conditions of the study representing different levels of average LMX and LMX differentiation.

To ensure adequate statistical power for between-team comparisons, I proposed that each condition should have usable data from a minimum of 20 teams or 30 individuals (either 80 teams or 180 people). GPower (Faul, Erdfelder, Lang, & Buchner, 2007) was used to determine rough estimates of necessary sample sizes for adequate power (.80). Effect sizes from Dulebohn and colleagues' (2012) meta-analysis were used to inform the power analysis. First, power analyses were conducted using the minimum, maximum, and average effect sizes of various potential antecedents to LMX perceptions (e.g., leader behavior, personality, and interpersonal

relationship variables). The meta-analytic correlations ranged from .18-.73, with a simple arithmetic average effect size being .42. These correlation coefficients were converted to Cohen's F for use in GPower, using formulas provided by Cohen (1988). The suggested sample size ranged from 390 (for the minimum effect size) to 18 for the maximum effect size, with the suggestion of 72 participants based on the average effect size. For the relationship with outcomes, the meta-analytic correlations between LMX and job performance, OCB, job satisfaction, satisfaction with the supervisor, and perceptions of politics, procedural justice, and distributive justice were used. Following the same procedure above, the meta-analytic correlations ranged from .30 to .57, with a simple arithmetic .42. These, then resulted in suggested sample sizes of 144, 36, and 72, respectively. Therefore, I proposed a sample consisting of 110 teams (23 in each shared configuration condition and 33 in each minority configuration condition) to have adequate power for simple group comparisons. Similarly, at the individual level, I proposed having 69 individuals in each shared configuration condition, 66 in each majority within the minority configurations, and 33 within the minority in each minority configuration to yield adequate power.

Participants

Participants were 339 undergraduate students (113 teams) enrolled in psychology courses at a large university in the Southeast. Participants must not have already completed a study that relied upon similar procedures (i.e., Frick, 2017). Upon arrival, participants were randomly distributed into teams with two other participants and one confederate. After removing participants who failed more than 25% of the attention checks (n = 8), or had zero standard deviation across at least two measures (n = 6), or missing data from more than 20 items (n =12), a final sample of 318 individuals remained. It should be noted that all conditions had usable data

from at least 30 participants, with the smallest condition sample sizes being 32 individuals in the low LMX-minority configuration and 33 individuals in the high LMX-minority configuration. The final sample was, according to self-reports, primarily female (66%), ethnically diverse (i.e., 45% White, 23% Hispanic, 28% Black/African American, 9% Asian, and 5% other), with an average self-reported age of 20.25 years (*SD* = 3.36), an average self-reported ACT score of 25.42 (*SD* = 3.87), and an average self-reported SAT of 1432.70 (*SD* = 281.19).

Each team was composed of four individuals: three subordinate participants, and a confederate leader. To maximize the legitimacy of the leader, participants were informed that the leader was formally appointed because of his/her score on a task-relevant knowledge measure. This was designed to create an expertise and legitimate power base for the leader (French & Raven, 1959). Additionally, participants were told that the leader would have a final say in the distribution of a specific reward (i.e., tickets for a monetary prize drawing) within the team, based on the leader's perceptions of contribution. This was designed to enhance the reward power base of the leader (French & Raven, 1959) as well as provide a tangible reward that may be expected to be differentially distributed based on LMX. This is particularly important since subordinate-rated, perceived LMX has been shown to be strongly, and positively correlated with both expert (*r* = .53; Cogliser & Schriesheim, 2000), legitimate power (*r* = .28; Cogliser & Schriesheim, 2000), and reward power (*r* = .23; Cogliser & Schriesheim, 2000).

Experimental Task

Individuals and teams were asked to complete two similar decision-making tasks. These tasks (NASA Exercise: Pfeiffer & Jones, 1969; Desert Survival: Lafferty & Pond, 1974; Appendices B and C) required participants to rank items in order of importance to survive a specific scenario.

"Correct" rankings have been created for each exercise by experts in the field (NASA Exercise: NASA, Pfeiffer & Jones, 1969; Desert Survival: United States Air Force, Lafferty & Pond, 1974). This type of task has been used successfully in group research (e.g., Staples & Zhao, 2006) and as a platform for manipulated leadership behavior (e.g., Murphy, Blyth, & Fiedler, 1992). Further, such tasks provide opportunities for discussion and disagreement about rankings and justifications, and thus elicit communication behaviors that mirror analogous behaviors in organizational settings.

Performance in the task was determined by comparing the individual's and/or team's rankings to the subject matter expert's rankings and determining a distance score for each item. If, for example, the team ranked a jackknife as the most important item, but the expert ranked it as fourth important, that would result in a distance score for that item of three (for this study, distance is defined as the absolute value of the difference in ranks). The distance scores for each item were summed, resulting in an overall performance score, with lower values representing better performance. If participants failed to rate an item within the given time, they received 15 points for this ranking. The best possible score was zero, indicating perfect agreement with the expert rankings. The worst possible score for a fully completed ranking set would be 112, indicating participants ranked items in an order opposite to the expert (e.g., first item ranked last, etc.), and the score associated with failing to provide a single response is 225. For the convenience of analysis and interpretation, these performance scores were then reversed (subtracted from 225) so that higher values indicated higher levels of performance.

Measures

Survival Knowledge Test

Participants were first asked to complete a 10-item knowledge test containing a sampling of pairs of items from both survival scenarios (Appendix D). Participants were asked to respond with which item in the pair would be more useful in the corresponding survival scenario. The primary purpose of this test was to create a legitimate and expertise power base for the confederate leader by suggesting that he/she scored the highest and thus earned leadership status. Given that this test taps into the relatively obscure knowledge domain that is relevant to task performance in the study, I examined whether groups differed in their scores, and found that they did not ($F(5,312) = 0.76$, $p = .58$) and thus did not use these scores as a control variable.

Demographics

Participants were asked to provide specific demographic information (Appendix E), including sex, age, ethnicity, and either their ACT or SAT composite scores (not including writing). Groups did not differ significantly in their sex composition ($F(5,311) = 0.21$, $p = .96$), or average age ($F(5,312) = 0.21$, $p = .96$), ACT ($F(5,177) = 0.26$, $p = .94$), or SAT scores ($F(5,194) = 1.50$, $p = .19$). Thus no demographic variables were used as controls.

Familiarity with Specific Technology and Virtual Teams

Participants were asked to respond to two items designed to capture their familiarity with technology and virtual teams. Participants used a seven-point Likert-type scale (1 = *extremely uncomfortable*, 7 = *extremely comfortable*) to respond to the following two items, similar to those which have been previously successfully used (Frick, 2017): "*How comfortable are you with using collaborative online documents, like Google Docs"* and "*How comfortable are you with using the chat function in collaborative online document programs, like Google Docs, to*

work in a team?" Groups did not differ in their scores on this comfort measure ($F(5,312) = 1.49$, $p = .19$) and thus this measure was not used as a control.

LMX

Although LMX was manipulated through the actions of the confederate leader that were directed toward the participant subordinates, it was imperative to check this manipulation. Therefore, LMX perceptions were measured using a modified version of the LMX-MDM (Appendix F) which accounts for the multidimensional nature of LMX (Liden & Maslyn, 1998). Specifically, the LMX-MDM is designed to capture affect, loyalty, contribution, and professional respect as four unique dimensions of LMX perceptions. Further, Liden & Maslyn (1998) showed evidence for a similar pattern of correlations with outcomes of interest as the LMX-7 (Scandura & Graen, 1984; Graen & Uhl-Bien, 1995) in addition to confirmatory factor analysis results which suggest multidimensionality over unidimensionality. This scale has been successfully used by researchers (e.g., Hu & Liden, 2012) who were also interested in the effects of LMX differentiation within teams.

Participants were asked to respond to ten items describing the nature of their relationship with the leader (e.g., "*I like my leader very much as a person"* (affect); *"My leader would come to my defense if I were 'attacked' by others"* (loyalty); *"I am willing to apply extra efforts, beyond those normally required, to meet my leader's work goals"* (contribution); *"I respect my supervisor's knowledge of and competence on the job"* (professional respect)) on a seven-point Likert-type scale (1 = *Strongly Disagree;* 7 = *Strongly Agree*). Each subscale shows adequate levels of internal reliability in this sample (Affect: $\alpha = .94$; Loyalty: $\alpha = .88$; Contribution: $\alpha = .73$; Professional Respect: $\alpha = .94$).

Conflict Processes

To measure conflict processes within the team, four raters evaluated transcripts for communication patterns indicative of the four processes proposed by DeChurch and colleagues (2013). These ratings were be made by trained raters, using an adapted version of the same scales that were the empirical foundation for DeChurch and colleagues' (2013) findings. The theoretical underpinning for the literature that informed DeChurch and colleagues' (2013) description of conflict processes relied primarily upon work conducted by Rahim (1983). Specifically, Rahim (1983) created a 28-item measure designed to capture five factors of interpersonal conflict (integrating, avoiding, dominating, obliging, and compromising). Collaborating is comprised of integrating; competing is comprised of dominating; and avoiding is comprised of the avoiding, obliging, and compromising factors from Rahim (1983). DeChurch and colleagues further suggested that openness is informed by scales like that of Jehn and Mannix (2001) that measure open discussion. Thus, raters were asked to rate each participant's behavior on modified and shortened versions of the original integrating (e.g., *"My team tries to investigate issues to find a solution acceptable to all of us"*), dominating (e.g., *"My teammates are generally firm in pursuing their sides of the issue"*), and avoiding (e.g., *"My teammates try to stay away from disagreement"*) subscales of Rahim's (1983) measure of conflict, and the open discussion subscale (e.g., *"Conflict was dealt with openly in my team"*) of Jehn and Mannix (2001), resulting in a 12 item measure (Appendix G) rated on a seven point Likert-type scale (*1 = Strongly Disagree*, 7 = *Strongly Agree*). Thus, for the scale used by raters a sample item is *"Member A tried to investigate issues to find a solution acceptable to the entire team."* Raters made ratings on the conflict processes used by each of the subordinates independently. Raters were only allowed to rate any one participant's conflict processes at a time. So, for example, one

rater rated the conflict processes for all A members, then rated conflict processes for all B members, then for all C members. This method is preferable to having raters rate the behaviors of all members of the team at the same time, to help ensure independence of ratings. It should be noted that it was not possible to fully blind raters to condition because the transcripts contained leader statements as well, which pointed toward condition. To mitigate this, raters were instructed to use the search/find function within the document to skip directly to the participant's comments and to avoid context clues of condition.

All four raters rated each participant's conflict processes. The ratings from raters showed moderate levels of interrater reliability (Collaborating: ICC(2,4) = .74; Competing: ICC(2,4) = .78; Avoiding: ICC(2,4) = .78; Openness: ICC(2,4) = .77; Shrout & Fleiss, 1979) and were thus averaged to create one score per conflict domain.

Participants also were asked to respond to a modified self-referential version (Appendix H) of the full original surveys as a method of corroborating the trained raters' ratings. A sample item is "*I tried to work with my team for a proper understanding of the problem."* Each subscale showed adequate reliability in this sample (Collaborating: α = .85; Competing: α = .82; Avoiding: α = .81; Openness: α = .71). See Appendix I for examples of transcripts that particularly exemplify each of the four conflict processes.

Team Member Satisfaction

It was also pertinent to assess individual level outcomes since a team is comprised of individual members. In addition to individual performance, I also measured satisfaction with team members using a modified version of Spector's (1985; Appendix J) four-item subscale (α = .79) targeting satisfaction with coworkers. These items (e.g., *"I enjoy my peers on my team."*)

target individuals' attitudes toward their teammates. Participants responded using a seven-point Likert-type scale (1 = *Strongly Disagree;* 7 = *Strongly Agree*)

Leader Satisfaction

I also used a modified version of the supervision satisfaction subscale of the JSS (Spector, 1985; Appendix J) to measure individuals' attitudes toward their leaders. Participants respond to this four-item scale (α = .88; e.g., *"My leader is quite competent in doing his/her job"*) on a seven-point Likert-type scale (1 = *Strongly Disagree;* 7 = *Strongly Agree*).

Psychological Distress

To capture individual-level psychological distress outcomes, participants were asked to complete the Job-related Affective Well-being Scale (JAWS; Van Katwyk, Fox, Spector, & Kelloway, 2000; Appendix K). Participants indicated the amount to which (*1= not at all, 7 = very much*) they experienced each emotion while completing the task. Responses were used to create four subscales for further analysis (high pleasure-high arousal, α = .88; high pleasure-low arousal α = .88; low pleasure-high arousal, α = .71; low pleasure-low arousal, α = .64). Sample items include "*I felt excited,"* "*I felt at ease," "I felt miserable,"* and *"I felt gloomy,"* respectively.

Procedure

After IRB approval (Appendix L) was obtained, the study commenced. Overall, this study (Figure 3) lasted roughly two hours. The nature of the study allowed for multiple teams to run through the experiment at once. All participants and confederates arrived in a classroom and were randomly assigned unique identifying codes (e.g., 1001).

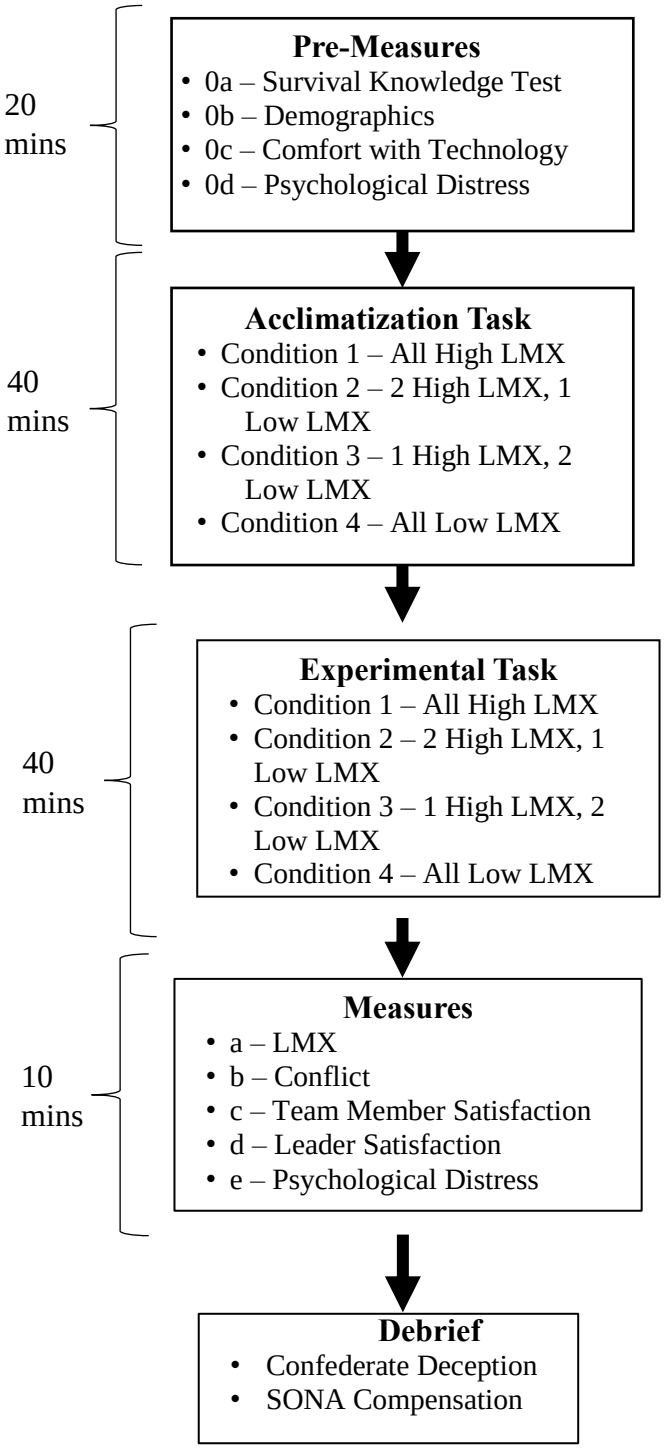

Figure 3. Study procedure.

Participants were then asked to complete the survival knowledge test, which, participants were told, would be used to determine the team leaders (confederates). As the experimenter appeared to be scoring the survival knowledge test, participants completed the demographic and familiarity with technology scales. Upon completion of these scales, the experimenter informed the room that the top scorers on the survival knowledge test had been selected as leaders. The experimenter then called confederates out of the room for special instructions as leaders. Participants were then briefed by the remaining experimenters. They received instructions (Appendix M) regarding the tasks, the study, and the role of the leader. Participants were informed that they were working together as a newly employed scientific consulting team. Together they needed to find the best possible solutions to specific survival scenarios to show their team's prowess in scientific reasoning. Further, participants were informed that each team had been given three tickets for a drawing for a $50 gift card and that these tickets would be distributed by the leader at the end of the session, based on the leader's perceptions of individual performance. In actuality, each participant received one ticket. The participants were also informed that leaders were not eligible for this drawing, but were instead financially rewarded based upon the team's overall performance. This was designed to mirror business models in which leaders have control over certain reward distributions and leader rewards are based upon team performance (e.g., manager of a sales team).

Following these instructions, participants were randomly assigned to teams and confederate leaders by pulling their team ID and role out of a coffee mug. Within each team, participants were assigned a letter (A, B, or C) and thus had a team number, a letter, and their individual code (e.g, Team ID 2002, team member B, participant code 1001). Participants were distributed among three separate classrooms based on their team member letter, such that all "A"

members were in one room, all “B” members were in another room, and all “C” members were in a third room, while all confederate leaders were in a final room. This was done specifically to minimize live interaction among teammates, limiting all interaction to the digital chatroom. Each team was pre-assigned to a condition that determined the nature of LMX configuration (e.g., all high LMX, two high LMX and one low LMX, two low LMX and one high LMX, all low LMX). These patterns of differentiation carried through both performance episodes, so a team stayed in the same condition for the entire study. This was necessary to be able to examine how average LMX and LMX differentiation predicted conflict patterns and ultimately outcomes within newly formed teams.

Team members were only allowed to communicate using the text-based chat function on Google Docs through accounts created specifically for this study. Participants received unique usernames and passwords to access these Google accounts. The accounts also had access to a variety of documents, through Google Drive, that provided information that could aid in successful completion of the task. All participants had access to all documents. Participants were not allowed to chat with other team members without the leader, or other team members, seeing their communications. During these exchanges, participants were only allowed to refer to themselves and their teammates/leader by assigned pseudonyms (viz., Alex, Bryce, Casey, and Logan).

Once all participants had access to their accounts, the experimenters provided instructions for the first task (NASA Exercise). Participants were given 10 minutes to complete the task as an individual, using whatever resources (Appendix N) were provided on the shared network drive in the relevant folder. Following this 10-minute period, participants were asked to work with their teams for 20 minutes to come to a final consensus. This time frame is in line with previous

studies using this task (e.g., Frick, 2017; Setlock, Quinones, & Fussell, 2007). It is during this period that leaders engaged in behaviors designed to mimic/elicit high LMX or low LMX relationships. These behaviors adhered to various scripts, depending on condition. Teams were told to reach a consensus, and that the list present when the team ran out of time was the one that would be graded. The leader was not allowed to directly give input regarding the list, but was responsible for entering in the rankings that the team suggested. The leader also asked all team members to affirm the final list. Only the leader was able to actually edit the list, but was scripted to only make changes that had been suggested by the team, and to make any suggested change to have a visual representation of conflicting ideas. This was designed to heighten levels of communication within the chat function. Teams were not allowed to finish the task early, and if they did, the leader was scripted to ask about the team's pastimes until the time period was complete. Following the acclimatization task completion, participants were instructed to wait while their data were analyzed. The experimenter then provided the group with the correct rankings and informed the team they were in the 80^{th} percentile. The leader was then given a few moments to provide feedback to the team on their performance. This cycle repeated once more with a novel task prompt (desert survival). Participants received all surveys after the experimental (second) performance episode.

Following completion of all surveys, participants were debriefed regarding the role of the confederate leader. It was made clear that the leader was not only a confederate, but that he/she behaved in a manner in order to create high or low LMX relationships and that the leader's behavior was not a reflection of the participants' ability. Participants were also informed that the leader had no control over their entry into the drawing for a monetary prize, and that each participant was entered into the drawing with one ticket. Participants were also informed that no

drawing existed for leaders based on the team's performance. Following participant debrief and excusal, all data from the online text-chat was copied and saved in order to be coded and analyzed.

LMX Manipulation

Gajendran and Joshi (2012) found evidence to suggest that, when dispersion (an aspect of virtuality) was high, LMX interacted with communication frequency with the leader to predict member influence on decision making, such that as communication frequency increased, the relationship between LMX and member influence on team decisions became significantly stronger. Therefore, given the virtual nature of these teams, when LMX was supposed to be high, the leader initiated communication more often than when it was supposed to be low. To further replicate high LMX, leaders offered support, validation, and compliments to participants, whereas when LMX was supposed to be low, leaders limited interactions to objective, task-related instructions and acknowledgement, only. This pattern of behavior falls in line with the prevailing notion of high LMX as a relationship marked by support, encouragement, and increased responsibilities or challenging/developmental assignments for the subordinate (Boies & Howell, 2006). Further, meta-analytic results suggest that leader behaviors and traits explain the most variance in the quality of LMX (Dulebohn et al., 2012). Specifically, leaders' use of contingent rewards and transformational leadership were most highly correlated with LMX quality ($\rho = .73$), along with follower's perceptions of similarity to, and liking of the leader ($\rho =$ .50 and .49, respectively). Lastly Dulebohn and colleagues (2012) showed that leader extraversion and agreeableness along with expectations of follower performance were also significantly correlated with follower perception of LMX quality ($\rho = .18, .18$, and .37,

respectively). This is all to say that one should be able to manipulate quality of the LMX relationship by manipulating leader behaviors.

Thus, for conditions in which the leader must engage in high LMX behaviors, the leader engaged in contingent reward behavior. Specifically, the leader provided feedback, rewards, and recognition to followers with whom they were maximizing LMX (Dulebohn et al, 2012). Leaders also attempted to foster trust, respect, and mutual obligation (Graen & Uhl-Bien, 1995) by engaging in transformational leadership. Specifically, leaders articulated a vision and encouraged acceptance of an overall team goal, in attempt to inspire and motivate followers (Dulebohn et al., 2012; Kuhnert & Lewis, 1987). Leaders also acted in a way that was consistent with extraverted and agreeable behavior (e.g., outgoing, positive, and warm). Further, to increase levels of LMX, leaders attempted to create a sense of similarity with followers. Overall, confederate leader scripted behaviors and responses was manipulated in adherence with the condition based on the above guidelines. Thus, by engaging in these behaviors with particular individuals within a team, in a very deliberate, consistent manner, confederate leaders aimed to directly manipulate the average level of LMX within the team as well as LMX differentiation (e.g., all high LMX, all low LMX, two high LMX relationships, or only one high LMX relationship).

To further manipulate LMX, leaders provided feedback to the team regarding previous performance. Once the correct answers were given to the team, based on condition, the leader socially rewarded individuals who were to receive high LMX for their participation in the process of performance. In this manner, teams received motivating feedback regarding performance, and LMX was effectively further manipulated through positive developmental feedback (a form of social support).

CHAPTER THREE:

RESULTS

Data were analyzed using SPSS and R. Means, standard deviations, skewness, kurtosis, and zero-order correlations are presented in Table 1. Means and standard deviations by condition are presented in Table 2. Box plots for each variable were examined for outliers and normality. Examining the skewness and kurtosis reveals that low positivity-low arousal (skewness = 2.19, kurtosis = 6.45) and low-positivity high-arousal (skewness = 2.80, kurtosis = 9.71 were positively skewed, and leptokurtic indicating floor effects. However, my analyses are generally robust to violations of normality so no corrections were made, but results should be interpreted with this pattern of data in mind. Plots used to indicate multivariate normality were examined. Null models for each variable of interest are presented in Table 3. Although only seven variables showed a significant amount of variance accounted for by the team, an additional seven showed ICCs of at least .03. Further, Bliese, Maltarich, and Hendricks (2018) argued that analyzing nested data using multilevel methods is beneficial, or at the very least, not harmful, regardless of the ICCs. Therefore, all individual level data were analyzed using multilevel modeling and restricted maximum likelihood.

To test hypothesis 1 which states, *individual perceptions of LMX quality will be higher when a leader engages in behaviors theoretically consistent with high LMX*, I ran a random intercepts random slopes model in which individual LMX condition (coded 0 = low LMX, 1 = high LMX) was entered as a level 1 predictor (Table 4). I then examined the parameter estimate

and significance of LMX level. Given that for each of the four facets of the LMX-MDM the parameter was positive and significant (Affect: 1.37, p <.001; Contribution: 0.59, p <.001; Loyalty: 1.73, p <.001; Professional Respect: 1.14, p <.001), hypothesis 1 was supported. I calculated the percentage of variance in perceived LMX quality accounted for by LMX level by subtracting the variance of this model from the variance of the baseline model (with only team as an explanatory variable) and dividing by the variance of the baseline model, in line with procedures put forth by Snijders and Bosker (1999). This yielded pseudo-R^2 values ranging from .29 (contribution) to .52 (loyalty).

To test hypothesis 2 which states, *individual satisfaction with the leader will be higher when a leader engages in behaviors theoretically consistent with high LMX*, I created a random intercepts random slopes model in which individual LMX condition (coded 0 = low LMX, 1 = high LMX) was entered as a level 1 predictor (Table 5). The parameter estimate and significance of LMX condition was positive and significant (1.53, p < .001), thus hypothesis 2 was supported. I calculated the percentage of variance in leader satisfaction accounted for by LMX level in line with procedures put forth by Snijders and Bosker (1999), suggesting that 49% of the variance in leader satisfaction could be accounted for by LMX condition.

To test hypothesis 3 which states, *individual satisfaction with the teammates, in general, will be higher when a leader engages in behaviors theoretically consistent with high LMX with the respondent*, I created a random intercepts random slopes model in which individual LMX condition (coded 0 = low LMX, 1 = high LMX) was entered as a level 1 predictor (Table 5). I then examined the parameter estimate and significance of LMX condition (0.47, p < .001). Given that the parameter was positive and significant, hypothesis 3 was supported. I calculated the percentage of variance in teammate satisfaction accounted for by LMX level in line with

procedures put forth by Snijders and Bosker (1999), suggesting that 16% of the variance in teammate satisfaction could be accounted for by LMX condition.

To test hypothesis 4 which states, *individual psychological distress will be lower when a leader engages in behaviors theoretically consistent with high LMX,* I used the above procedures to run a multilevel model (Table 6) for each of the four facets of the JAWS. Results suggested that LMX condition was a weak, but significant and positive predictor of both high positive-high arousal (γ_{01} = .41, p = .01, pseudo R^2 = .01) and high positive-low arousal (γ_{01} = .40, p = .01, pseudo R^2 = .01), and a strong, significant and negative predictor of both low positive-high arousal (γ_{01} = -0.29, p < .001, pseudo R^2 = .44) and low-positive-low arousal (γ_{01} = -.24, p = .02, pseudo R^2 = .43). Therefore, hypothesis 4 was supported.

To test hypothesis 5a which states, *individuals experiencing high levels of LMX will engage in higher levels of collectivistic conflict processes compared to their peers who experience low LMX,* I created a random intercepts random slopes model in which individual LMX condition (coded 0 = low LMX, 1 = high LMX) was entered as a level 1 predictor (Table 7) of collaborative conflict processes and openness conflict processes, both self-report and as rated by the trained raters. Parameter estimates suggest that LMX condition is a significant, positive predictor of both collaborative conflict processes (γ_{01} = .29, p = .01, pseudo R^2 = .16) openness conflict processes (γ_{01} = .39, p < .001, pseudo R^2 = .16) as rated by the trained raters. LMX condition was not, however, a significant predictor of self-reported collaborative (γ_{01} = .15, p = .07, pseudo R^2 = .08) nor openness (γ_{01} = .20, p = .07, pseudo R^2 = .18) conflict processes. Thus, hypothesis 5a was partially supported.

To test hypothesis 5b which states, *individuals experiencing low levels of LMX will engage in higher levels of individualistic conflict processes compared to their peers who*

experience high LMX, I used the above outlined analysis procedures to find percent of variance in an individual's use of individualistic conflict processes accounted for by LMX level as well as parameter estimates for LMX level (Table 8). Parameter estimates suggest that LMX condition was a significant, positive predictor of self-reported competitive conflict processes (γ_{01} = .17, p < .001, pseudo R^2 = .04) but not competitive conflict processes rated by the raters (γ_{01} = .04, p = .72, pseudo R^2 = .03). On the other hand, LMX condition was a significant negative predictor of avoidance conflict processes as rated by the raters (γ_{01} = -.35, p < .001, pseudo R^2 = .15), but not self-reported avoidant processes (γ_{01} = .15, p = .16, pseudo R^2 = .04). By in large, this hypothesis was unsupported given the lack of significant findings in the expected directions. It is worth noting that the results regarding rated avoidant conflict processes were in line with the hypothesis.

To test hypothesis 6a which states, *individuals experiencing high levels of LMX will have higher levels of individual performance than their peers who experience low LMX,* I used the above outlined analysis procedures to find percent of variance accounted for by LMX level as well as parameter estimates. The outcome variable, in this instance, is the individual's performance on the second task prior to beginning team work on the second task. This allows for LMX level to still have influence (from the first performance episode) but also isolate's individual performance from team performance. Results (Table 9) suggest that LMX condition did not have a significant effect on individual performance (γ_{01} = -0.52, p = .70, pseudo R^2 = .09). Therefore, hypothesis 6a was not supported.

To test hypothesis 6b which states, *teams with more individuals experiencing high levels of LMX will perform better,* data were collapsed across individuals resulting in one value indicating the number of individuals receiving high LMX behaviors (3, 2, 1, or 0). Team

performance was the score for the final, team-product from the second performance episode. A one-way analysis of variance (ANOVA) was then used to determine if the number of individuals experiencing high levels of LMX had a significant effect on team performance. Results from an ANOVA including all teams failed to support a significant effect of the number of high LMX relationships within the team on performance ($F(3,109) = 2.04$, $p = .11$). However, an ANOVA including only teams whose members were not dropped from the individual-level analyses (n = 94) was significant ($F(3, 90) = 3.26$, $p = .03$. I, therefore, examined Post-hoc Tukey HSD tests on this set of teams which revealed that teams which included no high LMX relationships (M = 167.19, SD = 10.37) performed significantly better than teams with two high LMX relationships (M = 159.41, SD = 8.83, $p = .046$) and marginally significantly better than teams with all high LMX relationships (M = 158.20, SD = 8.85, $p = .052$) and teams with only one high LMX relationship (M = 160.00, SD = 11.92, $p = .07$). Given that these results are in the opposite direction of what was hypothesized, and that they only appear when teams are excluded from analyses based on individual members' indicators of failed attention, this hypothesis is not supported.

To test hypothesis 7 which states *RLMX will moderate the relationship between LMX level and satisfaction with the leader, such that the relationship between one's LMX level and one's satisfaction with the leader will be weaker as the magnitude of RLMX increases*, I used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 10). The parameter estimates for the main effect of RLMX was significant ($\gamma_{02} = -1.27$, $p < .001$). Further, the parameter estimates for interaction between

LMX condition and RLMX was significant ($\gamma_{03} = 1.11$, $p < .001$). The group means are plotted in Figure 4 and suggest that high LMX may buffer the negative effects of RLMX on leader satisfaction. Because the results indicated a stronger relationship between LMX and satisfaction with the leader as RLMX increased, the opposite relationship of what was hypothesized, this hypothesis was not supported.

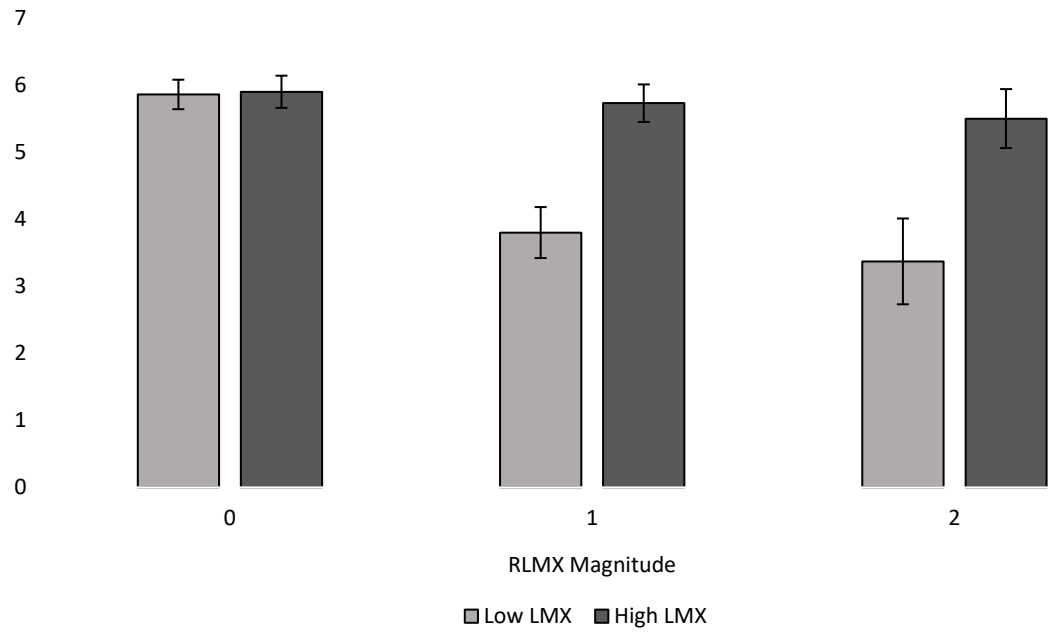

Figure 4. Representation of group differences in leader satisfaction from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

To test hypothesis 8 which states, *RLMX will moderate the relationship between LMX level and satisfaction with teammates, such that the relationship between one's LMX level and one's satisfaction with teammates will be will be weaker as the magnitude of RLMX increases*, I

used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 10). The parameter estimates for the main effect of RLMX was significant (γ_{02} = -0.53, p = .04). Further, the parameter estimates for the interaction term for LMX condition RLMX (γ_{03} = 0.36, p = .05) was significant. The group means are plotted in Figure 5 and suggest that high LMX may buffer the negative effects of RLMX on teammate satisfaction. Because the results indicated a stronger relationship between LMX and satisfaction with teammates as RLMX increased, the opposite relationship of what was hypothesized, this hypothesis was not supported.

To test hypothesis 9 which states, *RLMX will moderate the relationship between LMX level and psychological distress, such that the relationship between one's LMX level and one's psychological distress will be stronger as the magnitude of RLMX increases*, I used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 10). The parameter estimates for the main effect of RLMX on low positivity-high arousal was significant (γ_{02} = 0.26, p = .02). A similar pattern emerged for low positivity low-arousal (γ_{02} = 0.29, p = .01), but not for either of the high positivity domains. Further, no parameter estimates for the interaction were significant, thus this hypothesis was not supported.

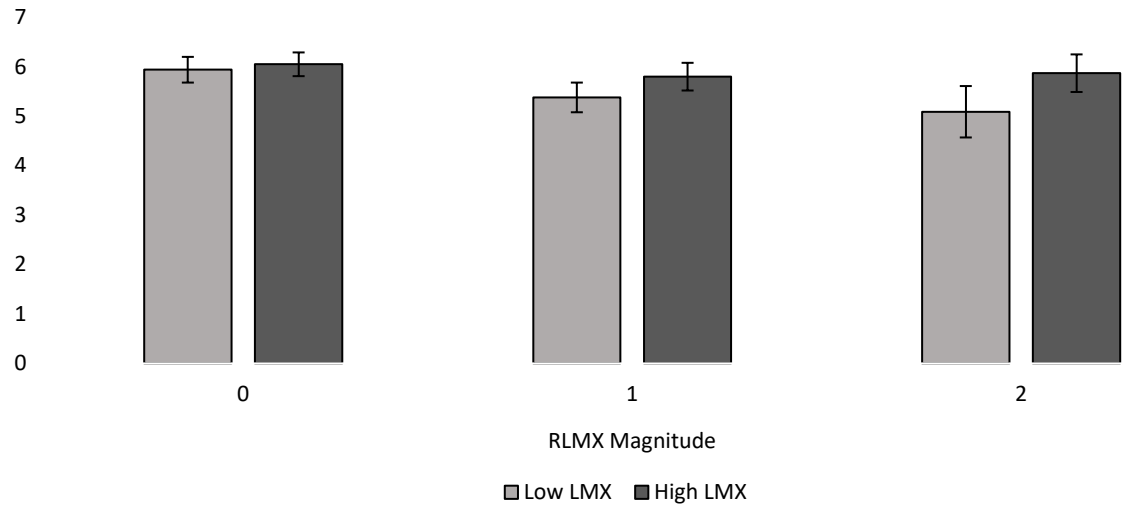

Figure 5. Representation of group differences in teammate satisfaction from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

To test hypothesis 10a which states, *RLMX will moderate the relationship between LMX level and individualistic conflict processes, such that the relationship between one's LMX level and the use of individualistic conflict processes will be stronger as the magnitude of RLMX increases,* I used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 11). The parameter estimates for the main effect of RLMX was significant for rated avoiding (γ_{02} = 0.29, p < .001). The parameter for the interaction term for LMX condition and RLMX was significant only for rated avoiding (γ_{03} = -.38, p < .001). These results are illustrated in Figure 6. Overall, this hypothesis is partially supported.

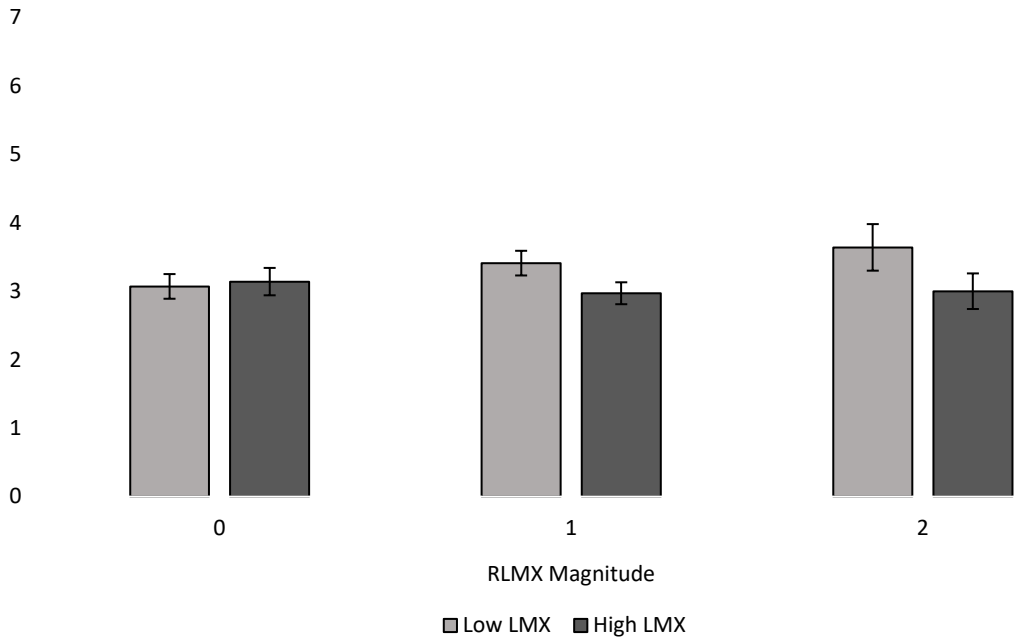

Figure 6. Representation of group differences in rated avoiding conflict processes from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

To test hypothesis 10b which states, *RLMX will moderate the relationship between LMX level and collectivistic conflict processes, such that the relationship between one's LMX level and the use of collectivistic conflict processes will be stronger as the magnitude of RLMX increases*, I used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 12). The parameter estimates for RLMX were significant for self-report collaboration (γ_{02} = -0.26, $p < .001$), rated collaboration

(γ_{02} = -0.22, p = .02), and rated openness (γ_{02} = -0.26, p = .01). The parameter estimates for the interaction between LMX condition and RLMX was significant only for rated openness (γ_{03} = 0.26, p = .05). Collaboration results are illustrated in Figure 7 and openness results are illustrated in Figure 8. Overall, this hypothesis was partially supported.

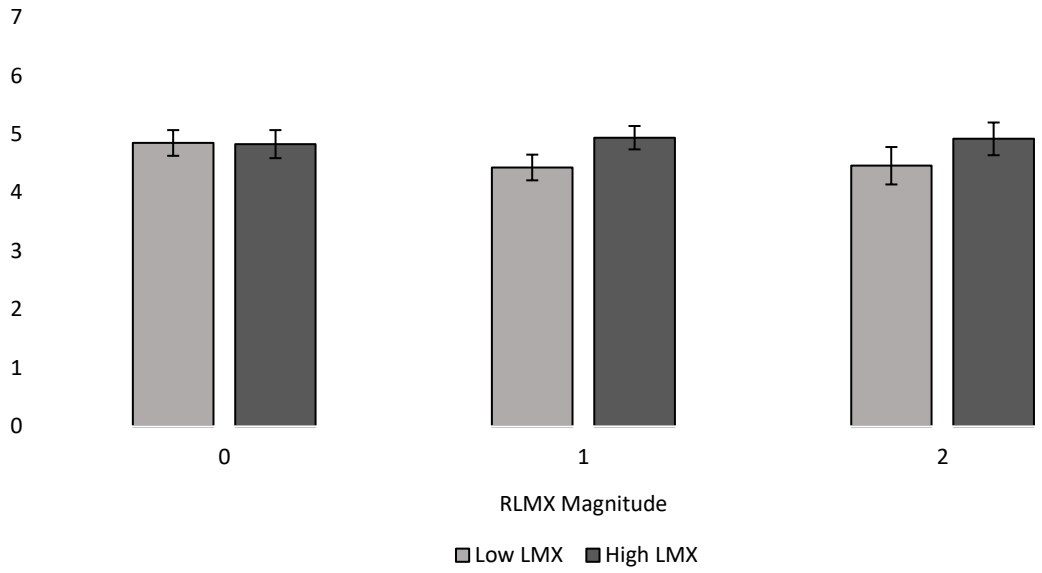

Figure 7. Representation of group differences in rated collaboration conflict processes from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

To test Hypothesis 11a which states, *RLMX will moderate the relationship between LMX level and individual performance, such that the relationship between one's LMX level and one's performance will be stronger as the magnitude of RLMX increases,* I used a random intercepts random slopes (for the effect of LMX condition) fixed slopes (for the effects of RLMX and the interaction) model with an interaction between one's absolute value RLMX (the number of

individuals experiencing a different level of LMX within the team ranging from 0 to 2) and one's LMX level (Table 13). None of the parameter estimates were significant, thus this hypothesis was not supported.

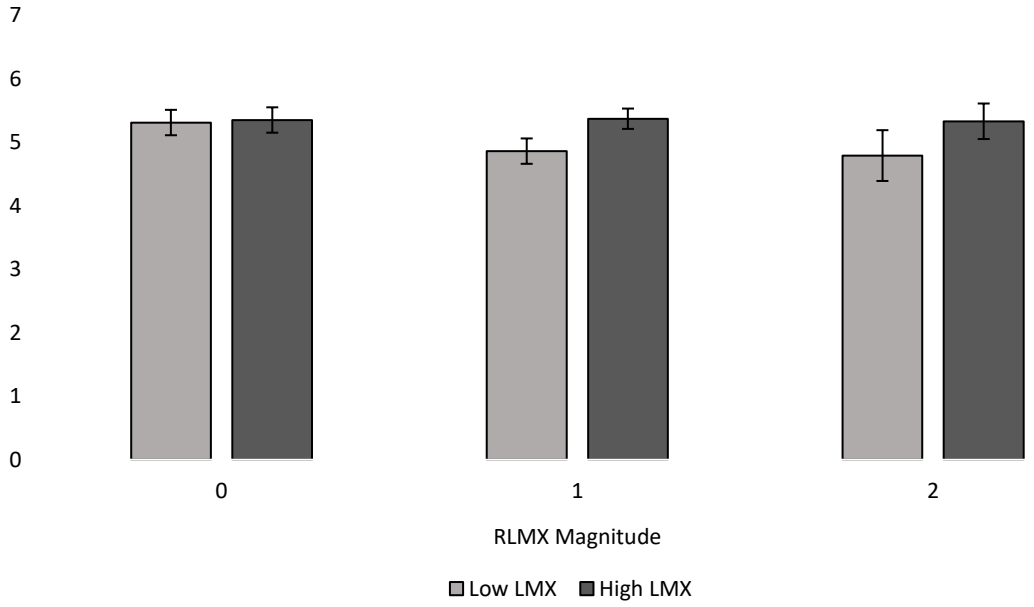

Figure 8. Representation of group differences in rated openness conflict processes from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

To test hypothesis 11b which states, *LMX configuration will moderate the relationship between average LMX and team performance such that: (i) Teams with a shared configuration and low LMX (all followers have low LMX) will perform worse than all other teams; (ii) Teams with a shared configuration and high LMX (all followers have high LMX) will perform better than all other teams;(iii) Teams with a minority configuration will have equivalent performance*

levels, the post hoc analyses from hypothesis 6b were reexamined. Because team that had high levels of LMX and had a shared configuration (coded as 3) did not perform significantly better than any other groups, hypothesis *11bi* was unsupported. Because teams that had a shared configuration and low levels of LMX (coded as 0) did not perform worse than any other teams, hypothesis *11bii* was unsupported. To test hypothesis *11biii,* I used equivalency testing procedures (Rogers, Howard, Vassey, 1993). These procedures are designed to determine if the means from two samples can be considered equivalent, as opposed to most statistical methods which assume equivalence and test for significant differences. These procedures required the establishment of a range of acceptable mean differences beyond which mean differences are considered meaningful enough to discredit equivalence. Based on previous work using this study design (Frick, 2017) mean performance ranges from 35 to 48 points, with standard deviations of 12 to 15 points. Differences in Frick's (2017) study between conditions in which the average score was 35.35 and 40.28 were not significant. Therefore, to establish a conservative range of acceptable differences, I set δ at 4 points. Thus, if the 95% confidence interval ($CI_{95\%}$ = [-6.44, 7.61]) of the mean difference between teams with a minority configuration and high average LMX and those with a minority configuration and a low average LMX included 0 but did not include either -4 or +4, this hypothesis would have been considered supported. However, this was not the case and thus hypothesis *11biii* was unsupported.

Post-Hoc Analyses

Given the nature of the task, improved motivation or commitment to perform may not have been able to translate into improved performance. Participants would be unlikely to improve their performance without gaining access to specialized knowledge or training. This was reflected in non-significant group and individual differences in task performance. However, this

does not necessarily mean that participants did not try or want to improve their performance. To capture potential changes in motivation to perform, I included two supplementary measures. Each measure consisted of five items ranked on a seven-point Likert-scale (1 = Strongly Disagree, 7 = Strongly Agree). For the first scale, the item stems were "When I was working ALONE" and for the second scale, the item stems were "When I was working with my TEAM." The content of these items was "I was committed to doing well on the desert survival task," "I really cared about doing well on the desert survival task," "I was dedicated to doing well on the desert survival task," "I put forth a lot of effort to do well on the desert survival task,, and "I was motivated to do well on the desert survival task." The motivation to work while alone scale had high reliability (α = .96) as did the motivation to work while in the team scale (α = .96). To examine the interaction between RLMX and LMX on motivation, I conducted two more multilevel regressions following the procedures outlined above. Results (Table 13) suggest that although there was no significant effect of RLMX or interaction effect of RLMX and LMX on motivation to perform while alone, there was for motivation to work in the team. Specifically, the parameter estimate for RLMX was significant (γ_{02} = -0.33, p = .02). Further, the parameter estimate for the interaction of RLMX and LMX was significant and positive (γ_{03} = 0.39, p = .02). This suggests that although being in the minority may be de-motivating, having the lone high LMX relationship within a team might buffer this negative effect. These group differences are illustrated in Figure 9.

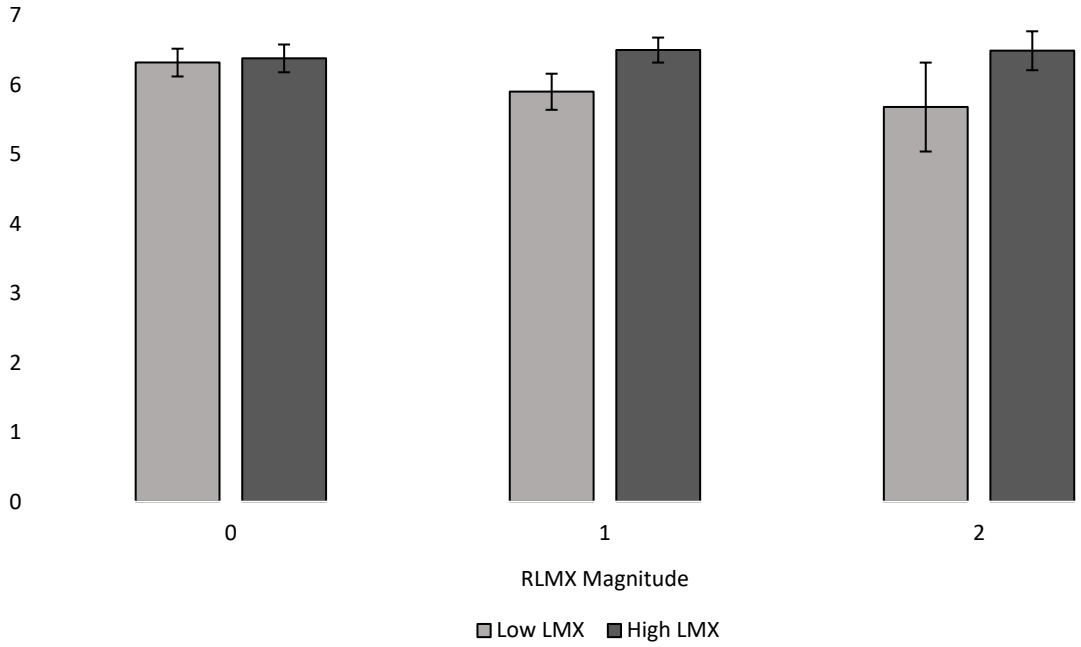

Figure 9. Representation of group differences in motivation to work while in the team from raw data.

**Note: Error bars represent two times the standard error. An RLMX magnitude of 0 represents being in a shared configuration. An RLMX magnitude of 1 represents being in the majority (one of two participants at the same LMX level) within a minority configuration. An RLMX magnitude of 2 represents being in the minority (the lone participant at the level of LMX) within a minority configuration.*

Table 1. Descriptive statistics and correlations

	Mean	SD	Skew.	Kurt.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.Ind. Perf.	143.39	11.29	0.23	-0.17																				
2.HPLA	4.05	1.52	-0.05	-0.79	-.04																			
3.HPHA	2.57	1.34	0.55	-0.78	.01	**.53**																		
4.LPLA	1.55	0.74	2.19	6.45	-.01	**-.27**	**-.18**																	
5.LPHA	1.44	0.70	2.80	9.71	.00	**-.38**	-.04	**.61**																
6.LMX-Aff.	4.91	1.65	-0.77	-0.09	.02	**.48**	**.42**	**-.36**	**-.41**															
7.LMX-Loy.	4.61	1.64	-0.68	-0.13	-.01	**.39**	**.35**	**-.23**	**-.34**	**.75**														
8.LMX-Cont.	5.41	1.23	-1.07	1.76	-.03	**.32**	**.30**	**-.28**	**-.33**	**.60**	**.59**													
9.LMX-Resp.	4.93	1.64	-0.87	-0.01	.03	**.50**	**.40**	**-.27**	**-.38**	**.89**	**.75**	**.59**												
10.Mot.-Aln.	5.93	1.12	-1.59	3.30	.04	.09	.09	**-.25**	-.03	.10	.09	**.18**	.07											
11.Mot-Team	6.24	1.00	-2.23	6.70	.00	**.37**	**.35**	**-.36**	**-.42**	**.54**	**.48**	**.62**	**.51**	**.18**										
12.Tmt. Sat.	5.73	1.15	-1.14	0.93	-.01	**.43**	**.29**	**-.32**	**-.41**	**.56**	**.43**	**.40**	**.54**	.07	**.53**									
13.Lead. Sat.	5.16	1.58	-0.84	-0.13	.04	**.44**	**.34**	**-.30**	**-.36**	**.87**	**.72**	**.49**	**.84**	.04	**.52**	**.59**								
14.Open-Rat.	5.19	0.82	-1.14	1.47	-.03	.02	.09	-.09	-.01	.09	**.20**	**.18**	.08	.05	**.28**	.08	**.16**							
15.Comp-Rat	3.07	0.93	0.96	0.82	.07	-.10	-.01	**.15**	**.23**	**-.18**	-.08	**-.12**	**-.16**	-.05	**-.12**	**-.36**	-.10	**.43**						
16.Avoid-Rat	3.20	0.76	1.06	1.26	.04	-.05	**-.14**	.09	.01	**-.13**	**-.20**	**-.15**	-.10	-.04	**-.25**	-.10	**-.21**	**-.88**	**-.40**					
17.Colb.-Rat	4.75	0.89	-0.75	0.22	-.11	.07	.11	**-.19**	**-.12**	**.19**	**.22**	**.27**	**.17**	.08	**.36**	**.35**	**.23**	**.68**	**-.16**	**-.63**				
18Colb.- Self	5.73	0.74	-0.93	1.61	.01	**.33**	**.21**	**-.16**	**-.22**	**.40**	**.41**	**.49**	**.40**	**.16**	**.55**	**.43**	**.40**	**.35**	-.02	**-.36**	**.39**			
19.Open-Self	5.90	0.89	-1.39	3.88	.11	**.30**	**.22**	**-.20**	**-.19**	**.33**	**.32**	**.45**	**.32**	**.18**	**.48**	**.36**	**.31**	**.34**	.05	**-.37**	**.29**	**.68**		
20.Avoid-Self	4.32	0.96	0.12	-0.50	-.02	.06	.03	.08	-.05	**.22**	**.23**	**.15**	**.25**	-.06	.11	.08	**.15**	**-.13**	-.11	**.18**	**-.11**	**.11**	**-.12**	
21.Comp-Self	4.50	1.16	-0.08	-0.42	-.06	**.12**	**.20**	.02	-.01	**.14**	**.31**	**.36**	**.19**	.05	**.25**	-.03	**.14**	**.28**	**.19**	**-.22**	.09	**.36**	**.23**	**.13**

**Note: Due to pairwise deletion, N = 312-318, correlations presented in boldface are significant p < .05. Ind. Perf. = Individual performance. HPLA = High positive-low arousal. HPHA = High positive-high arousal. LPLA = Low positive-low arousal. LPHA = Low positive-high arousal. LMX-Aff = LMX-affect. LMX-Loy = LMX-loyalty. LMX-Cont = LMX- contribution. LMX-Resp = LMX-professional respect. Mot-Aln = Motivation to perform while alone. Mot-Team = Motivation to perform while in the team. Tmt. Sat = Satisfaction with teammates. Lead. Sat = Leadership satisfaction. Open-Rat. = Openness conflict behavior – judge-rated. Comp-Rat = Competing conflict behavior-judge-rated. Avoid-Rat = Avoiding conflict behavior-judge-rated. Colb.-Rat = Collaboration conflict behavior-judge-rated. Colb.-Self = Collaboration conflict behavior-self-rated. Open-Self = Openness conflict behavior – self-rated. Avoid-Self = Avoiding conflict behavior-self-rated. Comp-Rat = Competing conflict behavior-self-rated.*

Table 2. Means and Standard Deviations by Condition

	Low-Minority		Low-Majority		Low-Shared		High-Minority		High-Majority		High-Shared	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	20.63	3.48	20.05	2.53	20.33	3.52	19.94	2.96	20.20	2.98	20.38	4.36
Surv. Know.	6.47	1.32	6.67	1.22	6.45	1.20	6.30	1.26	6.34	1.24	6.30	1.20
Tech. Comf.	6.20	0.81	5.78	0.96	5.69	1.29	5.71	1.04	6.00	0.86	5.85	1.06
Ind Prf.	142.03	10.72	143.33	11.48	144.64	11.60	142.38	11.10	142.25	11.03	144.48	11.63
HPLA	3.61	1.92	3.68	1.59	4.15	1.36	4.04	1.71	4.26	1.39	4.34	1.35
HPHA	2.16	1.27	2.31	1.29	2.53	1.35	2.61	1.35	3.01	1.30	2.63	1.38
LPLA	2.05	1.27	1.61	0.80	1.47	0.54	1.58	0.77	1.41	0.58	1.45	0.53
LPHA	1.91	1.34	1.56	0.81	1.39	0.44	1.38	0.69	1.38	0.51	1.24	0.31
LMX-Affect	3.42	1.99	3.63	1.68	5.45	1.01	5.20	1.43	5.56	1.30	5.54	1.20
LMX-Loyal	3.03	1.98	3.33	1.63	4.78	1.15	5.62	1.05	5.35	1.26	5.23	1.08
LMX-Contr.	5.03	1.72	4.70	1.37	5.59	0.88	5.53	1.17	5.80	1.02	5.65	1.01
LMX-Resp.	3.84	2.17	3.66	1.65	5.52	1.06	5.10	1.56	5.44	1.42	5.50	1.11
Mot.-Alone	5.99	1.41	5.77	1.26	5.77	1.06	6.14	1.03	6.26	0.81	5.76	1.15
Mot.- Team	5.68	1.81	5.90	0.99	6.32	0.81	6.49	0.80	6.51	0.72	6.38	0.77
Tmmt Sat.	5.09	1.46	5.38	1.15	5.94	1.04	5.87	1.10	5.80	1.13	6.05	0.96
Lead Sat.	3.37	1.81	3.80	1.49	5.86	0.94	5.50	1.29	5.73	1.15	5.90	0.93
Avoid -Rated	3.64	0.94	3.41	0.73	3.07	0.72	3.00	0.76	2.97	0.62	3.14	0.74
Open-Rated	4.79	1.13	4.86	0.82	5.31	0.75	5.33	0.80	5.37	0.62	5.35	0.78
Collab.-Rated	4.46	0.91	4.43	0.89	4.85	0.88	4.92	0.81	4.94	0.84	4.83	0.91
Comp.-Rated	2.96	0.94	3.02	1.02	3.12	0.87	3.00	1.10	3.03	0.88	3.19	0.87
Avoid-Self	4.51	1.01	4.45	0.97	4.33	0.82	4.54	0.94	4.19	0.97	4.32	0.90
Open-Self	5.59	1.22	5.74	1.03	6.00	0.62	5.92	0.82	6.09	0.78	5.89	0.86
Collab.-Self	5.39	1.08	5.54	0.74	5.89	0.57	5.72	0.81	5.83	0.63	5.83	0.69
Comp.-Self	4.09	1.26	4.35	1.12	4.28	0.98	4.75	1.16	4.90	1.27	4.57	1.09

**Note: Surv. Know. = Survival knowledge. Tech Comf = Comfort with technology.Ind. Prf. = Individual performance. HPLA = High positive-low arousal. HPHA = High positive-high arousal. LPLA = Low positive-low arousal. LPHA = Low positive-high arousal. LMX-Aff = LMX-affect. LMX-Loy = LMX-loyalty. LMX-Cont = LMX- contribution. LMX-Resp = LMX-professional respect. Mot-Aln = Motivation to perform while alone. Mot-Team = Motivation to perform while in the team. Tmt. Sat = Satisfaction with teammates. Lead. Sat = Leadership satisfaction. Open-Rat. = Openness conflict behavior – judge-rated. Comp-Rat = Competing conflict behavior-judge-rated. Avoid-Rat = Avoiding conflict behavior-judge-rated. Colb.-Rat = Collaboration conflict behavior-judge-rated. Colb.-Self = Collaboration conflict behavior-self-rated. Open-Self = Openness conflict behavior – self-rated. Avoid-Self = Avoiding conflict behavior-self-rated. Comp-Rat = Competing conflict behavior-self-rated.*

Table 3. Null models for outcomes of interest

	LMX Affect	LMX Loyalty	LMX Contribution	LMX Respect	Leader Satisfaction	Peer Satisfaction
Intercept	4.90	4.59	5.40	4.91	5.14	5.71
σ^2	2.55	2.70	1.61	2.35	2.13	1.03
τ_{00}	.17	.00	.00	.38	.37	.37
-2 Log Likelihood	-646.69	-646.47	-559.81	-645.20	-630.03	-524.82
ICC2	0.06	0.00	0.00	**0.14**	**0.15**	**0.26**
df	3	3	3	3	3	3
Log Likelihood Ratio	1.19	0.00	0.00	5.81	6.88	19.93
p	.28	.96	.96	**.02**	**.01**	**<.001**
	HPHA	HPLA	LPHA	LPLA	Collab-Self	Comp-Self
Intercept	2.56	4.02	1.47	1.59	5.72	4.49
σ^2	1.78	2.20	0.48	0.63	0.59	1.34
τ_{00}	.00	.15	.07	.02	.00	.00
-2 Log Likelihood	-576.69	-622.67	-377.07	-407.03	-389.67	-529.16
ICC2	0.00	0.06	**0.13**	0.04	0.00	0.00
df	3	3	3	3	3	3
Log Likelihood Ratio	0.00	1.30	5.01	0.43	0.00	0.00
p	.96	.26	**.03**	.51	.96	.99
	Avoid-Self	Open-Self	Collab-Rate	Comp-Rate	Avoid-Rate	Open-Rate
Intercept	4.31	5.88	4.75	3.09	3.19	5.19
σ^2	0.89	0.73	0.79	0.54	0.54	0.56
τ_{00}	.03	.10	.02	.33	.05	.12
-2 Log Likelihood	-464.68	-444.85	-442.27	-432.38	-387.87	-407.39
ICC2	0.03	**0.12**	0.03	**0.38**	0.09	**0.18**
df	3	3	3	3	3	3
Log Likelihood Ratio	0.25	4.17	0.22	43.55	2.53	9.97
p	.62	**.04**	.64	**.00**	.11	**.00**

	Indiv-Perf	Mot-Alone	Mot-Team
Intercept	143.51	5.89	6.22
σ^2	121.67	1.30	1.07
τ_{00}	9.01	.00	.00
-2 Log Likelihood	-1285.91	-523.07	-490.59
ICC2	0.07	0.00	0.00
df.	3	3	3
Log Likelihood Ratio	1.52	0.00	0.00
p	.22	.96	.99

Table 4. Multilevel Regression Results for Hypothesis 1

	Affect-FS	Affect-RS	Contrib - FS	Contrib - RS	Loyalty - FS	Loyalty - RS	Respect - FS	Respect - RS
Intercept	**4.23**	**4.12**	**5.13**	**5.09**	**3.74**	**3.66**	**4.36**	**4.29**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	**1.37**	**1.37**	**0.56**	**0.59**	**1.77**	**1.73**	**1.16**	**1.14**
LMX Condition p	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**
LMX 95% LL	1.03	0.97	0.30	0.30	1.45	1.36	0.82	0.74
LMX 95% UL	1.71	1.76	0.83	0.88	2.08	2.10	1.51	1.54
u_{0j}	0.57	1.79	0.06	0.62	0.52	1.72	0.71	1.94
e_{ij}	1.86	1.51	1.37	1.14	1.63	1.30	1.80	1.41
u_{1j}		1.62		0.62		1.42		1.64
AIC	1179.99	1157.82	1028.28	1019.85	1140.57	1112.96	1183.73	1166.09
BIC	1195.01	1180.36	1043.30	1042.38	1155.59	1135.49	1198.76	1188.62
logLikelihood	-586.00	-572.91	-510.14	-503.92	-566.28	-550.48	-587.87	-577.04
-2*LL	1171.99	1145.82	1020.28	1007.85	1132.57	1100.96	1175.73	1154.09
Pseudo-R^2	.27	.41	.15	.29	.40	.52	.23	.40

**Note: Significant values are presented in boldface. Calculations were completed using REML. FS = Fixed slopes. RS = Random slopes. Affect = LMX- affect. Contrib = LMX- contribution. Loyalty = LMX-loyalty. Respect = LMX-professional respect.*

Table 5. Multilevel Regression Results for Hypotheses 2 and 3

	Leader Sat.- FS	Leader Sat- RS	Team Sat- FS	Team Sat- RS
Intercept	**4.35**	**4.28**	**5.49**	**5.48**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	**1.62**	**1.53**	**0.47**	**0.47**
LMX Condition p	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition 95% LL	1.32	1.17	0.22	0.22
LMX Condition 95% UL	1.92	1.89	0.71	0.72
u_{0j}	0.88	2.05	0.40	0.61
e_{ij}	1.31	1.09	0.91	0.87
u_{1j}		1.32		0.11
AIC	1118.04	1085.09	973.82	974.82
BIC	1133.06	1107.62	988.84	997.35
logLikelihood	-555.02	-536.54	-482.91	-481.41
-2*LL	1110.04	1073.09	965.82	962.82
Pseudo R^2	.38	.49	.12	.16

**Note: Significant values are presented in boldface. Calculations were completed using REML. FS = Fixed slopes. RS = Random slopes. Leader Sat. = Leader satisfaction. Team Sat = Teammate satisfaction.*

Table 6. Multilevel Regression Results for Hypothesis 4

	HPHA-FS	HPHA-RS	HPLA-FS	HPLA-RS	LPHA-FS	LPHA-RS	LPLA-FS	LPLA-RS
Intercept	**2.37**	**2.37**	**3.86**	**3.86**	**1.57**	**1.62**	**1.65**	**1.70**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	**0.41**	**0.41**	**0.40**	**0.40**	**-0.26**	**-0.29**	**-0.19**	**-0.24**
LMX Condition p	**0.01**	**0.01**	**0.02**	**0.02**	**<.001**	**<.001**	**0.03**	**0.02**
LMX Condition 95% LL	0.12	0.12	0.06	0.06	-0.41	-0.48	-0.35	-0.44
LMX Condition 95% UL	0.70	0.70	0.73	0.73	-0.10	-0.10	-0.03	-0.04
u_{0j}	0.00	0.00	0.12	0.12	0.06	0.54	0.02	0.44
e_{ij}	1.76	1.76	2.18	2.18	0.42	0.27	0.53	0.36
u_{1j}		0.00		0.00		0.46		0.50
AIC	1094.37	1098.37	1176.29	1180.29	676.56	639.68	724.71	700.96
BIC	1109.39	1120.90	1191.31	1202.83	691.58	662.21	739.74	723.49
logLikelihood	-543.18	-543.18	-584.15	-584.15	-334.28	-313.84	-358.36	-344.48
-2*LL	1086.37	1086.37	1168.29	1168.29	668.56	627.68	716.71	688.96
Pseudo R^2	.01	.01	.01	.01	.13	.44	.16	.43

**Note: Significant values are presented in boldface. Calculations were completed using REML. FS = Fixed slopes. RS = Random slopes. HPLA = High positive-low arousal. HPHA = High positive-high arousal. LPLA = Low positive-low arousal. LPHA = Low positive-high arousal.*

Table 7. Multilevel Regression Results for Hypothesis 5a

	Collab-Self- FS	Collab-Self- RS	Collab-Rated- FS	Collab-Rated-RS	Open-Self- FS	Open-Self- RS	Open-Rated- FS	Open-Rated-RS
Intercept	**5.66**	**5.66**	**4.60**	**4.60**	**5.80**	**5.79**	**5.00**	**4.98**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	0.15	0.15	**0.30**	**0.29**	0.19	0.20	**0.39**	**0.39**
LMX Condition p	0.07	0.07	**<.001**	**0.01**	0.06	0.07	**<.001**	**<.001**
LMX Condition 95% LL	-0.01	-0.01	0.11	0.07	-0.01	-0.01	0.21	0.21
LMX Condition 95% UL	0.31	0.32	0.50	0.50	0.39	0.41	0.57	0.58
u_{0j}	0.00	0.01	0.05	0.10	0.10	0.32	0.15	0.33
e_{ij}	0.55	0.54	0.72	0.67	0.69	0.60	0.51	0.47
u_{1j}		0.00		0.35		0.28		0.13
AIC	723.02	726.97	826.04	826.91	832.27	830.61	759.44	755.70
BIC	738.04	749.50	841.02	849.39	847.30	853.14	774.42	778.18
logLikelihood	-357.51	-357.48	-409.02	-407.46	-412.14	-409.30	-375.72	-371.85
-2*LL	715.02	714.97	818.04	814.91	824.27	818.61	751.44	743.70
Pseudo R^2	0.07	0.08	0.09	0.16	0.06	0.18	0.09	0.16

**Note: Significant values are presented in boldface. Calculations were completed using REML. FS = Fixed slopes. RS = Random slopes. Self = self-rated. Rated = judge-rated. Collab = Collaboration conflict process. Open = Openness conflict process.*

Table 8. Multilevel Regression Results for Hypothesis 5

	Comp-Self- FS	Comp-Self- RS	Comp-Rated-FS	Comp-Rated-RS	Avoid-Self- FS	Avoid-Self- RS	Avoid-Rated-FS	Avoid-Rated-RS
Intercept FE	**4.27**	**4.27**	**3.05**	**3.05**	**4.24**	**4.24**	**3.351**	**3.367**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	**0.47**	**0.47**	0.04	0.04	0.15	0.15	**-0.338**	**-0.345**
LMX Condition p	**<.001**	**<.001**	0.72	0.72	0.16	0.16	**<.001**	**<.001**
LMX Condition 95% LL	0.22	0.22	-0.16	-0.16	-0.06	-0.06	-0.505	-0.516
LMX Condition 95% UL	0.72	0.72	0.23	0.23	0.37	0.37	-0.171	-0.173
u_{0j}	0.00	0.00	0.35	0.35	0.06	0.06	0.088	0.18
e_{ij}	1.29	1.29	0.52	0.52	0.85	0.85	0.48	0.461
u_{1j}		0.00		0.00		0.00		0.064
AIC	996.28	1000.28	819.30	823.30	885.71	889.71	719.92	720.314
BIC	1011.31	1022.82	834.29	845.78	900.73	912.25	734.892	742.772
logLikelihood	-494.14	-494.14	-405.65	-405.65	-438.86	-438.86	-355.96	-354.157
-2*LL	988.28	988.28	811.30	811.30	877.71	877.71	711.92	708.314
Pseudo R^2	0.04	0.04	0.03	0.03	0.04	0.04	0.12	0.15

**Note: Significant values are presented in boldface. Calculations were completed using REML. FS = Fixed slopes. RS = Random slopes. Self = self-rated. Rated = judge-rated. Comp = Competing conflict process. Avoid = Avoiding conflict process.*

Table 9. Multilevel Regression Results for Hypothesis 6a

	Individual Performance- Fixed Slopes	Individual Performance- Random Slopes
Intercept	**143.67**	**143.60**
Intercept p	**<.001**	**<.001**
LMX Condition	-0.52	-0.52
LMX Condition p	0.69	0.70
LMX Condition 95% LL	-3.04	-3.21
LMX Condition 95% UL	2.00	2.17
u_{0j}	10.77	9.15
e_{ij}	117.22	110.23
u_{1j}		39.83
AIC	2422.90	2424.33
BIC	2437.88	2446.81
logLikelihood	-1207.45	-1206.16
-2*LL	2414.90	2412.33
Pseudo R^2	.04	.09

**Note: Significant values are presented in boldface. Calculations were completed using REML.*

Table 10. Multivariate Regression Results for Hypotheses 7-9

	Leader Sat	Team Sat	HPHA	HPLA	LPHA	LPLA
Intercept	**5.56**	**5.89**	**2.52**	**4.09**	**1.36**	**1.42**
Intercept p	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
LMX Condition	0.33	0.09	0.23	0.27	-0.09	0.00
LMX Condition p	0.21	0.71	0.30	0.29	0.55	1.00
LMX Condition 95% LL	-0.19	-0.36	-0.20	-0.23	-0.40	-0.30
LMX Condition 95% UL	0.84	0.54	0.65	0.77	0.22	0.30
RLMX	**-1.27**	**-0.43**	-0.19	-0.29	**0.26**	**0.29**
RLMX p	**0.00**	**0.00**	0.17	0.07	**0.02**	**0.01**
RLMX 95% LL	-1.61	-0.70	-0.47	-0.61	0.04	0.08
RLMX 95% UL	-0.93	-0.17	0.08	0.02	0.48	0.50
LMX X RLMX	**1.11**	**0.36**	0.23	0.16	-0.18	-0.23
LMX X RLMX p	**0.00**	**0.05**	0.25	0.50	0.15	0.07
LMX X RLMX 95% LL	0.69	0.00	-0.16	-0.29	-0.42	-0.48
LMX X RLMX 95% UL	1.52	0.71	0.62	0.60	0.06	0.02
u_{0j}	0.95	0.50	0.00	0.10	0.50	0.39
e_{ij}	1.13	0.88	1.77	2.18	0.28	0.37
u_{1j}	0.47	0.06	0.00	0.00	0.42	0.43
AIC	1051.51	973.38	1104.58	1183.91	643.02	703.69
BIC	1081.51	1003.37	1134.58	1213.91	673.02	733.68
logLikelihood	-517.76	-478.69	-544.29	-583.96	-313.51	-343.84
-2*LL	1035.51	957.38	1088.58	1167.91	627.02	687.69

**Note: Significant values are presented in boldface. Calculations were completed using REML. Leader sat = Leader satisfaction. Team sat = Teammate satisfaction. HPLA = High positive-low arousal. HPHA = High positive-high arousal. LPLA = Low positive-low arousal. LPHA = Low positive-high arousal.*

Table 11. Multivariate Regression Results for Hypothesis 10b

	Compete-Self	Compete-Rated	Avoid-Self	Avoid-Rated
Intercept	**4.32**	**3.09**	**4.36**	**3.09**
Intercept p	**0.00**	**0.00**	**0.00**	**0.00**
LMX Condition	0.32	0.07	0.01	0.02
LMX Condition p	0.09	0.74	0.93	0.89
LMX Condition 95% LL	-0.05	-0.33	-0.31	-0.25
LMX Condition 95% UL	0.68	0.46	0.34	0.29
RLMX	-0.07	-0.06	-0.14	**0.29**
RLMX p	0.57	0.58	0.19	**0.00**
RLMX 95% LL	-0.30	-0.27	-0.34	0.12
RLMX 95% UL	0.17	0.15	0.07	0.47
LMX X RLMX	0.19	-0.03	0.16	**-0.38**
LMX X RLMX p	0.26	0.87	0.27	**0.00**
LMX X RLMX 95% LL	-0.14	-0.33	-0.12	-0.60
LMX X RLMX 95% UL	0.52	0.28	0.45	-0.15
u_{0j}	0.00	0.35	0.06	0.13
e_{ij}	1.30	0.53	0.86	0.46
u_{1j}	0.00	0.00	0.00	0.03
AIC	1007.74	831.59	897.30	718.59
BIC	1037.74	861.51	927.30	748.48
logLikelihood	-495.87	-407.80	-440.65	-351.29
-2*LL	991.74	815.59	881.30	702.59

**Note: Significant values are presented in boldface. Calculations were completed using REML. Compete = Competing conflict behavior. Avoid = Avoiding conflict behavior. Self = Self-rated. Rated = Judge-rated.*

Table 12. Multivariate Regression Results for Hypothesis 10a

	Collab-Self	Collab-Rated	Open-Self	Open-Rated
Intercept	**5.86**	**4.78**	**5.99**	**5.23**
Intercept p	**<.001**	**<.001**	**<.001**	**<.001**
LMX Condition	-0.01	0.08	-0.03	0.12
LMX Condition p	0.91	0.63	0.85	0.44
LMX Condition 95% LL	-0.25	-0.23	-0.37	-0.19
LMX Condition 95% UL	0.22	0.39	0.31	0.44
RLMX	**-0.26**	**-0.22**	-0.21	**-0.26**
RLMX p	**0.00**	**0.02**	0.06	**0.01**
RLMX 95% LL	-0.41	-0.40	-0.43	-0.46
RLMX 95% UL	-0.11	-0.03	0.00	-0.06
LMX X RLMX	0.21	0.26	0.24	**0.26**
LMX X RLMX p	0.05	0.07	0.09	**0.05**
LMX X RLMX 95% LL	0.00	-0.01	-0.04	0.01
LMX X RLMX 95% UL	0.42	0.53	0.52	0.52
u_{0j}	0.00	0.07	0.29	0.28
e_{ij}	0.53	0.68	0.60	0.47
u_{1j}	0.00	0.28	0.23	0.11
AIC	725.73	831.38	836.37	759.52
BIC	755.72	861.29	866.36	789.44
logLikelihood	-354.86	-407.69	-410.18	-371.76
-2*LL	709.73	815.38	820.37	743.52

**Note: Significant values are presented in boldface. Calculations were completed using REML. Collab = Collaboration conflict behavior. Open = Openness conflict behavior. Self = Self-rated. Rated = Judge-rated.*

Table 13. Multivariate Regression Results for Hypothesis 11 and Post-Hoc Analyses

	Individual Performance	Motivation to Perform Alone	Motivation to Perform in Team
Intercept FE	**144.70**	**5.74**	**6.29**
Intercept p	**<.001**	**<.001**	**<.001**
LMX Condition	-0.59	0.12	0.11
LMX Condition p	0.77	0.53	0.58
LMX Condition 95% LL	-4.61	-0.24	-0.29
LMX Condition 95% UL	3.43	0.47	0.52
RLMX	-1.34	0.10	**-0.33**
RLMX p	0.26	0.42	**0.02**
RLMX 95% LL	-3.67	-0.13	-0.61
RLMX 95% UL	1.00	0.32	-0.05
LMX X RLMX	0.21	0.13	**0.39**
LMX X RLMX p	0.91	0.42	**0.02**
LMX X RLMX 95% LL	-3.31	-0.19	0.07
LMX X RLMX 95% UL	3.72	0.46	0.72
u_{0j}	9.13	0.00	0.68
e_{ij}	110.25	1.24	0.66
u_{1j}	41.52	0.00	0.53
AIC	2421.75	994.12	884.63
BIC	2451.66	1024.11	914.63
logLikelihood	-1202.87	-489.06	-434.32
-2*LL	2405.75	978.12	868.63

**Note: Significant values are presented in boldface. Calculations were completed using REML.*

CHAPTER FOUR:

DISCUSSION

The purpose of this study was to examine the effects of experimentally manipulated LMX and relative LMX within teams on individual conflict processes, attitudes, and psychological distress, as well as team-level performance. Overall, results suggest that differential levels of perceived LMX within teams can be manipulated via scripted leader behaviors in a lab setting. Beyond manipulating perceptions of LMX within a short time frame, this study lends support for a causal relationship between leader LMX behaviors and a range of follower outcomes. These outcomes include satisfaction with the leader and teammates, use of specific conflict management processes, and motivation to work with the team.

Previous studies have largely viewed leader behaviors through an average leadership style framework, despite the individualized aspect of LMX. Although this study occurs within a short time frame and within the lab setting with minimal long-term outcomes for participants, results support the notion that if leaders behave in certain ways, followers will report higher levels of LMX. This is a first step to addressing the causality concerns of whether high levels of perceived LMX result from leader behaviors or if leader behaviors result from high levels of perceived LMX. Because participants were randomly assigned to LMX condition, independent of their ability or other demographic characteristics, we can begin to address the causal link from leader behaviors to follower outcomes, particularly attitudinal outcomes. Further, the results

indicate that this manipulation of LMX behaviors influenced all four facets of LMX (i.e., affect, contribution, loyalty, and professional respect).

Results from this study not only suggest that manipulating leader behaviors can result in increased levels of perceived LMX, but may also influence leader satisfaction and satisfaction with teammates. Within the context of these virtual, short-term, student project teams, receiving low levels of LMX behaviors reduced one's satisfaction with the leader and teammates. This aligns with the notion that LMX and RLMX are inherently rooted in social comparison (Hu & Liden, 2013). In shared configurations, followers in either the high or low LMX conditions had no comparison for the leader's behaviors and were thus easily satisfied with the leader and their team. However, in teams where leader behaviors were experimentally differentiated, such that one person in the team received a different level of LMX than the other two, individuals who received low LMX behaviors were significantly less satisfied with their leader and with their teammates because they had a reference group against which they could compare themselves.

Beyond perceptions of the leader and teammates, results suggest that leader LMX behaviors can influence follower psychological distress and wellbeing. Results showed that, regardless of team LMX configuration, followers who received low levels of LMX had higher levels of psychological distress (as indicated by both low positive-low arousal and low positive-high arousal domains) than did participants who received high levels of LMX behaviors. Because RLMX did not consistently moderate this relationship, simple levels of LMX may play a more important role in psychological distress than LMX configuration within the team. This suggests there is an aspect to LMX behaviors that influences psychological distress and wellbeing beyond simple social comparison, because if social comparison were the only method by which LMX influenced psychological distress and wellbeing, effects would not have been

present within shared configurations. In other words, it appears that receiving positive attention from the leader has beneficial effects regardless of the leader's relations with other team members.

In addition to attitudinal outcomes, I also examined the effects of leader LMX behaviors on follower conflict processes, both self-reported and rated by four trained raters. Results regarding LMX, RLMX, and self-reported or rated conflict processes were mixed. Rated conflict processes were more consistently linked to LMX behaviors than self-reported conflict processes. Results suggest that RLMX may magnify the link between LMX and conflict processes such that individuals in minority configurations who receive low LMX are particularly likely to use avoidance techniques and to refrain from using openness conflict processes. Typically, evidence suggests that individuals in the outgroup may be hesitant to express dissenting opinions (Asch, 1956). Although there was no active silencing of those with low LMX in this study, individuals receiving low LMX within minority configurations, were less likely to actively contribute to conflict resolution within the team. Such behavior may be particularly problematic in teams with high levels of interdependence and specialized knowledge or roles. Further, the disconnect between self-reported and rated conflict behaviors may indicate that individuals might not recognize that they are using these behaviors. It is worth noting, however, that these effects may be limited in their generalizability to short-term, virtual, project teams. Longer team lifespan, or face-to-face interactions may change the suitability or attractiveness of various conflict processes. Thus, readers should be cautious about overgeneralizing these results.

Lastly, this study examined the effects of differentiated LMX behaviors on both individual and team performance. Given the nature of the task, however, this study failed to yield any significant meaningful results regarding performance. Specifically, the nature of this type of

task is such that heightened motivation may not necessarily translate to heightened performance. Therefore, I also examined the effects of differentiated LMX behaviors on motivation to perform alone and as part of the team. Results indicated that, as with other outcomes of interest, individuals who received low LMX behaviors were significantly less motivated to work with the team if an individual with high LMX was present within the team.

Theoretical Implications

Taken together, these results can inform future discussion and examination of LMX within teams. First, and foremost, this study lends support to the all-or-nothing perspective regarding LMX differentiation, particularly with regard to attitudinal outcomes. Individuals' LMX conditions tended to particularly influence their attitudes when they had an upward social comparison within their team. Although this study occurred over a short period of time in a contrived lab setting, results may indicate that leaders need to ensure they treat their followers equally, or at the very least equitably, in order to establish similar or equitable levels of LMX. In doing so, leaders may avoid harming the motivation, psychological well-being, and job attitudes of those who would otherwise be left out. Although within this study, differences in motivation did not translate into differences in individual or team performance, in field settings, one may expect to find a similar pattern of influence on subordinate performance. In this vein, this study provides less evidence for the benefits of high-LMX behaviors than the risks of low-LMX behaviors, particularly within highly differentiated teams. Although there was a main effect of LMX such that high LMX generally resulted in more positive outcomes than low LMX, low LMX appears to only be particularly detrimental within differentiated teams. Further, high LMX does not appear to be more beneficial within differentiated teams, implying an overall net loss

for differentiated teams compared to shared configurations. This suggests that if a leader's concern is for the entirety of the team, LMX may be all-or-nothing.

Secondly, this study indicates that perceptions of LMX can be rapidly developed in a lab setting over a total interaction period of only 40 minutes. Although one would be hard pressed to directly map these results on to LMX quality established over weeks, months, or years, this does indicate that an understanding of the nature of the relationship between one's leader and oneself begins to develop almost immediately. This suggests that in order to better study causality regarding LMX and outcomes in the field, one should ideally capture teams immediately upon their formation and initial meetings, otherwise perceptions regarding LMX, the leader, and peers have already begun to form, and thus temporal precedence is lost.

Third, this study lends credence to the notion that perceived LMX is actually tied to leader behaviors. This is an assumption that has been held by the field but never directly tested without falling into issues regarding assumptions of average leadership style or single-source bias. By providing experimental evidence that leader behaviors can directly influence perceptions of all aspects of LMX, this study opens theoretical doors regarding the utility and weighting of specific leadership behaviors. Although this study takes a step toward empirically and experimentally linking leader behaviors to follower perceptions of LMX and related attitudinal outcomes, it is necessary to further examine what specific leader behaviors most directly influence LMX. Future studies should continue to separate measures of leader behavior from the self-reported measures of LMX and outcomes, in order to better tease apart these relationships.

Further this study is one of the first to capitalize upon DeChurch and colleagues' (2013) conflict processes distinction using rater coding. Results indicate that self-rated conflict

behaviors and rater coded conflict behaviors are only modestly correlated and have differential relationships with LMX and RLMX. This opens a wide field of potential research questions, such as how leader or teammate perceptions of one's conflict processes influence future interactions, essentially supporting a reciprocal link between follower conflict processes and leader LMX behaviors. Results from this study may support a link between one's perceived resources (e.g., social support from a high-LMX relationship) and a choice of individualistic versus collectivistic conflict processes. It seems as though individuals who are aware of their limited social resources may be motivated to protect their remaining resources (e.g., self-esteem) by engaging in individualistic conflict processes, despite the potential cost to the team. Conversely, individuals who may be secure in their standing with the leader (e.g., high-LMX relationships) may be more willing to expend effort on behalf of the team, choosing collectivistic conflict processes.

Practical Implications

In addition to providing experimental evidence for the theoretical link between leader behavior and follower perceptions of LMX and relevant attitudes, this study provides managers, leaders, and human resource professionals with several points of practical intervention. First, by providing an experimental link between leader behaviors and follower perceptions of LMX, this study supports the use of LMX as a prescriptive theory. However, results also suggest that leaders should be cautious when building strong relationships, or risk ostracizing those with whom they have yet to create a high quality relationship. Results from this study suggest that despite previous notions, there are clearly negative outcomes to establishing differential levels of LMX within one's team, especially if this creates a minority of low LMX individuals.

This study also points towards the generally negative ramifications of establishing differential levels of LMX within a team. Specifically, followers not only are dissatisfied with their leader and experienced heightened psychological distress when they experience low LMX within a team with a minority configuration, but they are less satisfied with their teammates and less likely to engage in collectivistic conflict processes. Both of these outcomes move beyond the simple dyad of leader-follower dynamics and outcomes, and begin to affect other members of the team, who, for all intents and purposes, could be innocent bystanders. In these situations, in which followers in the outgroup are unwilling to dissent or speak up, it may be beneficial for the leader to use explicitly inclusive language (e.g., "what do you think?") to elicit their views (Weiss, Kolbe, Grote, Spahn, Grande, 2017). By being intentional about their language use, leaders may help individuals with low LMX overcome their outgroup status to provide information and use collaborative conflict processes.

On a very practical level, this study lends credence to efforts to train leaders to create high LMX relationships with all followers. Specifically, by showing that leader behaviors can directly influence follower perceptions of LMX, this study suggests that if leaders are trained to change their behaviors to fall more in line with high LMX with all followers, they may be able to actively change both the perceived levels of LMX and LMX differentiation within the team. Similarly, this study also highlights the need for leaders and followers to be aware of how their behaviors are linked to others' perceptions of them. Results suggest that followers may not be aware of how their chosen conflict processes are perceived by others. By providing leaders and followers with a clear link between their behaviors and others' perceptions, and ultimately others' attitudes and behaviors, practitioners may be able to enhance team dynamics and, in cases in which motivation actually translates to performance, improved performance.

Strengths and Limitations

Given the experimental design of this study, there are many threats to external validity. Perhaps most threatening to the generalizability of the findings of this study is the nature of the team and leader relationships. Specifically, the teams comprised of students motivated solely for entry into a raffle (and course extra credit), and had a known lifespan of 40 shared minutes, two hours total. Most organizational teams come together for longer periods of time, with higher stakes for participation. Thus, the effects of LMX behaviors seen in this study may be mitigated in organizations by increased opportunities and motivation to develop relationships. Further, inherent to its definition, is the fact that leadership is a process, marked by reciprocal interactions between the leader and followers. In this study, to ensure causality and internal validity, leader behaviors were scripted and so followers had no control over their LMX standing with the leader. So, unlike in organizational teams, where followers can exert influence over their leaders to alter the nature of their relationships, followers in this study had no influence on their relationship with the leader. This may suggest that although the relationship between LMX behaviors and attitudinal outcomes in this study is clearly causal, the relationship may be more muddied in actuality.

Additionally, the task used for this study, while providing an opportunity for participants to discuss, disagree, and communicate with one another, failed to provide participants and teams with a mechanism to translate effort and motivation into improved performance. Future iterations of lab-based manipulations of LMX behaviors within teams should use tasks that not only allow for conflict and conflict management, but also a stronger effort-performance relationship. Similarly, because the task yielded transcripts that included leader and follower language, it was not possible to completely blind raters to condition. This may have promoted experimenter bias

in ratings. As mentioned previously, steps were taken to mitigate this, but to truly prevent experimenter bias in this context, future iterations should use methods that allow researchers to fully remove any contextual clues as to participant condition while maintaining contextual information about the conflicts prior to coding conflict behaviors.

Lastly, one may call into question whether what was being manipulated was LMX, LMX behaviors, or something else entirely. One argument related to this notion is that LMX is a relationship that develops over time, and thus what was being manipulated and captured in this short term study could not be LMX. If that is the case, however, this study suggests that our measures of LMX must be flawed and capture something that is not LMX. Further, although LMX cannot be directly manipulated because it is the inherent quality of the relationship, this study sought to manipulate the behaviors associated with LMX to in-turn manipulate the quality of the relationship and ultimately the followers' perceptions of the relationship. As such, the short-term nature of this study may not be as strong of a limitation as it appears upon first blush. In fact, since randomly assigned differences in leader behaviors over the course of two, twenty-minute interactions resulted in significant differences in perceived LMX, our conceptualization of the nature of LMX may need to be reassessed. Perhaps LMX begins to develop over much shorter periods of time and is closely tied to leader behaviors.

Future Directions

The main purpose of this paper was to link objectively manipulated leader behaviors to perceptions of LMX as well as attitudinal and behavioral outcomes. A natural next step to further explore the findings from this study is to examine the relationship between leader behaviors and follower perceptions of LMX and other outcomes over a longer period of time. Work has been done, for example, on the relationship between perceived LMX and followers' upward influence

tactics (Epitropaki & Martin, 2013). Perhaps, in a longitudinal design, it would be possible to further explore the ways in which leaders' LMX behaviors influence followers' upward influence tactics and vice versa, ultimately establishing a long term LMX quality.

This study focused on two LMX configurations within teams (i.e., shared and minority). Future studies could further the understanding of the nature of LMX and RLMX within teams by examining them in bimodal and fragmented LMX configurations. Similarly, it may be worthwhile to examine how the number of individuals in the majority and the minority groups affects the relationship between leader behaviors and follower perceptions of LMX as well as follower and team outcomes. It may also be worthwhile to explore the specific leader behaviors, or the strength of the leader behaviors that are necessary to elicit perceptions of LMX.

Lastly, this study was limited to subjective reports of psychological distress and wellbeing. It may be beneficial from an occupational health perspective, to tie leader LMX behaviors with objective measures of follower immediate stress response (i.e., increased cardiac output, increased peripheral capillary constriction), or longer term physiological (e.g., decreased immune reactivity) strains or health outcomes (e.g., musculoskeletal disorders, cardiac disease).

Conclusions

The main purpose of this study was to explore the causal relationship between leader behavior and follower perceptions of LMX as well as follower attitudinal and behavioral outcomes. Results suggest that when leaders engage in behaviors theoretically consistent with high LMX, participants report higher levels of LMX compared to those that receive low levels of LMX. Further, results suggest that RLMX may strengthen the relationship between LMX and outcomes such as leader and teammate satisfaction, psychological distress, motivation to perform with the team, and use of avoidance, collaborative, and openness conflict processes. Specifically,

the negative consequences of low LMX seem only to be felt if there is a team member with high LMX against which one's own relationship can be compared. These effects may be particularly poignant when one is the lone individual with low LMX within a team.

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APPENDIX A:

CONFEDERATE SCRIPT

/ = you can address only one of the people named
, = you must address all of the relevant people
don't add flare like LOL or HAHA if it's not there
After participants have all shared their top 5, when a participant suggests a number for an item, immediately change that number.
At 15, 10, and 5 minutes, you must inform your team of the time remaining.

(Black text): Instructions for the confederate
Blue text: Dialogue to send to team via group chat
[text in brackets and underlined]: Fill in the blank with the appropriate choice for the conversation
Green text: Back-up dialogue in case team member ask questions, etc.
Purple text: Directed toward H participants
Yellow text: Directed toward L participants
Red text: Experimenter types this. DO NOT TYPE THIS.
Note: Space between lines means to send those sentences separately in a message each instead of a full paragraph

UNLESS IT'S IN BLUE, DO NOT EVER SEND A MESSAGE WITHOUT ADDRESSING THE RECIPIENT.

Wait until at least one participant has announced themselves in the chat.

hi I'm ready too! My codename is logan!

Experimenter

DO NOT SEND: Hi everyone, I'm Keaton, the experimenter in the leader lounge

Please don't start the task yet

You have to use the chat to talk

The leader (Logan) is the only one who can edit this document

The leader is not allowed to share their answers

Logan is only allowed to assign a ranking if you say it first

So if you want an item to be ranked 2, you HAVE to say the number 2

Your leader gets paid depending on how well you do as a team

Your leader gets to decide how to distribute the tickets into the drawing

OK so please take a moment to get to know one another a bit before I start your 20 minutes

OK Thanks!

Sooo I guess What's everyons majors? year in school

and lets do a fun fact

Alex, do you want to start?

[Alex/Bryce/Casey] that's awesome!! tell me more about that

Thnx [Alex/Bryce/Casey]

wait

SAME!!!

Bryce?

[Alex/Bryce/Casey] that's so legit!! what do you want to do with that degree?

Thanks for sharing [Alex/Bryce/Casey]

wait

I feel that!

Casey?

[Alex/Bryce/Casey] I love it!! do you have plans after you graduate?

K cool [Alex/Bryce/Casey]

wait

That sounds so interesting!

great! well it seems like we have a solid team

speak up during the study i wanna make sure we do well lol.

I reaally wanna make sure it's a group effort

Tell the experimenter to start the time. Start your timer.

DO NOT SEND: OK your 20 minutes begins now! Start working on the task.

Real quick, I literally based all of my anwers on the pdfs

I want yall to sort of summarize them

Like 1 or 2 sentences.

Or maybe the most imporant fact from each.

[Alex, Bryce/ y'all] pick which ones you want to briefly talk about.

Thanks!/ Thank you!/ Awesome!

If they don't respond just reply with

Alex? Bryce? Casey?

OK great. So lets now share our top 5 then we'll kinda sort it out

Alex you wanna go first? Just list out your top 5.

Awesom Alex. I was legit thinking something along those lines. Great job!

Thanks, Alex

Bryce you wanna go? Same thing. Top 5?

Nice Bryce! great points in there. I literally felt the same!

Thx, Bryce

Casey? What were you thinking for your top 5?

Solid thinking Casey! I def feel some of those answers! Nice work!

OK. Thx, Casey

(Once everyone answers:)

So now we need to figure out what ranking we're goint to go with

Y'all should take the lead on this discussion if you want

Ill just kinda jump in as I have thoughts

I wanna to make sure we make decisions as a team

Great points [Alex/Bryce/Casey]!

LOVE it [Alex/Bryce/Casey]!

[Alex/Bryce/Casey] what a great idea!

K. Thx for the idea [Alex/Bryce/Casey].

K. [Alex/Bryce/Casey] I appreciate you sharing

K thanks [Alex/Bryce/Casey]

k, lts move on to the next five, and then the bottom five.

What were you thinking for 6-10?

What a great idea, [Alex/Bryce/Casey]! What were you thinking for 15?

[Alex/Bryce/Casey] that's such a good point! What were your thoughts on 12?

Thats good thinking there [Alex/Bryce/Casey]! Thoughts on 13?

Noted [Alex/Bryce/Casey].

K thnx. [Alex/Bryce/Casey]

Sure [Alex/Bryce/Casey]

(If any questions arise during this time period from the participants, tell them:)

im not sure about that

maybe ask the experimenter

(Once the team has 1-15 complete)

SOOOOO I wanna make sure were all really on the same page.

[Alex/Bryce/Casey] how do you feel about where we have the Oxygen?

[Alex/Bryce/Casey] what about the matches?

[Alex/Bryce/Casey] what about the first aid kit?

Good point [Alex/Bryce/Casey]

I like that [Alex/Bryce/Casey]

[Alex/Bryce/Casey] that's brilliant

Kthanks [Alex/Bryce/Casey]

Thnx [Alex/Bryce/Casey]

Alright [Alex/Bryce/Casey] thanks

DO NOT SEND: You have one minute left

Are we all chill with this list?

DO NOT SEND: OK Your time is up.

I will grade your list.

Fingers crossed!

[Alex, Bryce/ y'all] you did a really great job!

Did yall have fun?

[Alex/Bryce/ Casey] do you do survivalist stuff like for real?

What about you?[Alex/Bryce/Casey]

You? [Alex/Bryce/Casey]

DO NOT SEND: OK The actual ranking was:

1. Oxygen
2. Water
3. Map
4. Food
5. Radio
6. Rope
7. First aid kit
8. Parachute
9. Life raft
10. Flares
11. Guns
12. Milk
13. Heating unit
14. Compass
15. Matches

So you got 40 points.

That puts you in the 80th percentile.

Im dead!

Not too bad but we can do better.

Anyone have any ideas on like how to do better? [Alex?/Bryce?/Casey?]

wait

I really value your input

OK Please leave the chat and tell the experimenters in your room that you are ready to begin filling out surveys

ROUND 2

Wait for one participants to announce their presence

hi I'm ready!

Wait for all participants to announce their presence

whooooo! Here we go again.

[Alex, Bryce/y'all] Im counting on you

Your time is about to start. Remember:

The leader (Logan) is the only one who can edit this document

The leader is not allowed to share their answers

Logan is only allowed to assign a ranking if y'all say it first

So if you want an item to be ranked 2, you HAVE to say the number 2

Your leader gets paid depending on how well you do as a team

Your leader gets to decide how to distribute the tickets into the drawing

Wait then send the next line

OK your 20 minutes begins now

K so lets quickly start with the pdfs again.

[Alex, Bryce/y'all] pick ur favorite pdf and then summarize the takeaways of those pdfs? in like a sentence or 2 again.

Real quickly.

Thanks!/ Thank you!/ Awesome!

If they don't respond just reply with

Alex? Bryce? Casey?

So, next lets all share our answers like last time

Casey how about you go first this time. Share your top 5?

Great ideas like always Casey. I was definitely feeling something like that.

OK, thx Casey

Bryce ur turn to go. Top 5?

Awesom Bryce. Yeah I really liked where you had a few of those

Thnkx Bryce

Alex? What were your top 5 this time?

Great job again Alex! I feel like we were definitely on the same page

Alright thanks Alex

(Once everyone answers:)

soooo lets figure out what ranking were gonna go with again

Thoughts on how we'll sort out these top 5?

[Alex/Bryce/Casey] knew I could count on you to make a good point!

[Alex/Bryce/Casey] your like reading my mind!

[Alex/Bryce/Casey] Glad were always on the same page!

Thnks for the suggestions [Alex/Bryce/Casey]

K thanks [Alex/Bryce/Casey]

[Alex/Bryce/Casey] I appreciate your input

K we need to move on to the next five, and then the last ones.

[Alex/Bryce/Casey] gat point perre usual! What were your thoughts on 15?

Awesome thinking and points [Alex/Bryce/Casey]! What were your thoughts on 14?

I'm so lucky to have you on my team [Alex/Bryce/Casey]! Thoughts on 13?

OK [Alex/Bryce/Casey].

Got it. [Alex/Bryce/Casey]

thanx [Alex/Bryce/Casey]

What bout the next five?

[Alex/ Bryce/ Casey] thoughts on where we have the salt?

[Alex/ Bryce/ Casey] how do you feel about the mirror?

[Alex/ Bryce/ Casey] what about the raincoat?

You have 1 minute remaining.

Are we all cool with this ranking?

You are out of time.

I will grade your final list.

thx again [Alex, Bryce/y'all] for really putting in extra effort this time! I rly hope we did good enough to get that extra money.

I feel like we did better.

Whaddya think?

[Alex] if you win the drawing what will you use ur 50 bucks on?

[Bryce?]

[Casey?]

DYING! Same!

The actual ranking was:

1. Mirror
2. Overcoats
3. Water
4. Flashlight
5. Parachute
6. Knife
7. Raincoat
8. First aid kit
9. Gun
10. Sunglasses
11. Compass
12. Map
13. Book
14. Liquor
15. Salt

You got 42 points which puts you in the 85th percentile.

HAHA were consistent!

Grt job team! See ya after to give you ur participation tickets.

Please leave the chat and tell your experimenter you are ready to start your surveys.

(Make sure the participants have ranked the items. Each item should have a number ranking

listed next to it. If there are items without a ranking, say): we need to make a decision on [item names]

(If the team tries to finish early, before the 10 minutes for the task are up, say the experimenter says we can't turn our answers in yet. Do you wanna just hang out and chat?). Then only respond when spoken too. Follow up with either "Anyone do anything awesome over the weekend?" or "Anyone going to do anything awesome this weekend"

(if anyone asks if you're reading a script or a robot say. "haha what? umm no. are you?"

if anyone asks what your ratings are say. "Unfortunately I'm not allowed to share my answers but I'm happy with our list"

if anyone asks what your major/year say the same as someone else (purple) in the team.

if anyone asks what you're going to do with extra money say "food"

APPENDIX B:
NASA EXERCISE

Scenario:

You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. However, due to mechanical difficulties, your ship was forced to land at a spot some 200 miles from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile trip. Below are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place the number 1 by the most important item, the number 2 by the second most important, and so on through number 15 for the least important.

Your Ranking

_____ Box of matches
_____ Food concentrate
_____ 50 feet of nylon rope
_____ Parachute silk
_____ Portable heating unit
_____ Two .45 caliber pistols
_____ One case of dehydrated milk
_____ Two 100 lb. tanks of oxygen
_____ Stellar map
_____ Self-inflating life raft
_____ Magnetic compass
_____ 5 gallons of water
_____ Signal flares
_____ First aid kit, including injection needle

_____ Solar-powered FM receiver-transmitter

Answers to the Survival on the Moon Exercise

Item NASA Ranking NASA's Reasoning

1. Two 100 lb. tanks of Oxygen: Most pressing survival need (weight is not a factor since gravity is one-sixth of the Earth's – each tank would weigh only about 17 lbs. on the moon)
2. 5 gallons of water: Needed for replacement of tremendous liquid loss on the light side
3. Stellar map: Primary means of navigation – star patterns appear essentially identical on the moon as on Earth
4. Food concentrate: Efficient means of supplying energy requirements
5. Solar-powered FM receiver-transmitter: For communication with mother ship (but FM requires line-of-sight transmission and can only be used over short ranges)
6. 50 feet of nylon rope**:** Useful in scaling cliffs and tying injured together
7. First aid kit, including: Needles connected to vials of injection needle vitamins, medicines, etc. will fit special aperture in NASA space suit
8. Parachute silk: Protection from the sun's rays
9. Self-inflating life raft: CO_2 bottle in military raft may be used for propulsion
10. Signal flares: Use as distress signal when the mother ship is sighted
11. Two .45 calibre pistols: Possible means of self-propulsion
12. One case of dehydrated milk: Bulkier duplication of food concentrate
13. Portable heating unit: Not needed unless on the dark side
14. Magnetic compass: The magnetic field on the moon is not polarized, so it's worthless for navigation
15 Box of matches: Virtually worthless -- there's no oxygen on the moon to sustain combustion

APPENDIX C:

ARCHAEOLOGICAL DIG IN EGYPT: THE SCENARIO

It is approximately 10:00 a.m. in mid-July and you have just crash landed in the Arabian Desert in eastern Egypt. Your team of archaeologists, yourself and two others, were headed to conduct a research dig in the desert. Your light twin-engine plane containing the bodies of the pilot and co-pilot has completely burned out with only the frame remaining. None of you have been injured. The pilot was unable to notify anyone of your position before the crash. However, he had indicated before impact that you were 50 miles from a mining camp, which is the nearest known settlement, and approximately 65 miles off the course that was filed in your Flight Plan. The immediate area is quite flat, except for occasional cacti, and appears to be rather barren. The last weather report indicated that the temperature would reach 110 F today, which means that the temperature at ground level will be 130 F. You are dressed in lightweight clothing-short-sleeved shirts, pants, socks, and street shoes. Everyone has a handkerchief and collectively, you have 3 packs of cigarettes and a ballpoint pen. Before your plane caught fire, your group was able to salvage the 15 items listed on the next page. Your task is to rank these items according to their importance to your survival, starting with a "1" for the most important, to a "15" for the least important.

Item	Team Ranking
Torch with 4 battery-cells	
Folding knife	
Air map of the area	
Plastic raincoat (large size)	
Magnetic compass	
First-aid kit	
45 caliber pistol (loaded)	
Parachute (red & white)	
Bottle of 1000 salt tablets	
2 liters of water per person	
A book entitled 'Desert Animals	
That Can Be Eaten'	
Sunglasses (for everyone)	
2 liters of 180 proof liquor	
Overcoat (for everyone)	
A cosmetic mirror	

Item	Rank	Rationale
Torch with 4 battery-cells	4	Essential for night time use
Folding knife	6	For cutting rope, food, etc.
Air map of the area	12	To have idea on present location
Plastic raincoat	7	To collect dew overnight
Magnet compass	11	Since awaiting rescue this isn't of much other use
First-aid kit	10	Everybody is safe at present
45 caliber pistol (loaded)	8	For defense. Three shots from a gun is also a recognized distress signal.
Parachute (red & white)	5	Use as tent
Bottle of 1000 salt tablets	15	Of no use in desert
2 liters of water per person	3	For drinking. A person actually requires a gallon of water a day in the desert.
A book entitled 'Desert Animals That Can Be Eaten'	13	Food is less important than water in the desert. Digestion consumes water
Sunglasses (for everyone)	9	Protection against glare
2 liters of 180 proof liquor	14	Useful as an antiseptic only as alcohol causes dehydration
Overcoat (for everyone)	2	Essential protection in desert – clothing helps ration sweat by slowing evaporation and prolonging the cooling effect
A cosmetic mirror	1	Means of visual signaling

APPENDIX D:

SURVIVAL KNOWLEDGE TEST

You are stranded on Mars with minimal resources. For each pair of items below, please select which would be more useful in helping you survive.

Mars pair 1

- **A tank of oxygen (1)**
- A magnetic compass (2)

Mars pair 2

- A box of matches (1)
- **Bottles of water (2)**

Mars pair 3

- **Star chart (1)**
- Powdered milk (2)

Mars pair 4

- **Lengths of cord (1)**
- Guns (2)

Mars pair 5

- **First aid kit (1)**
- Gas stove (2)

You are stranded in the desert with minimal resources. For each pair of items below, please select which would be more useful in helping you survive.

Desert Pair 1

- ❍ Table Salt (1)
- ❍ **Pocket knife (2)**

Desert Pair 2

- ❍ Two litres of coffee (1)
- ❍ **A rain jacket (2)**

Desert Pair 3

- ❍ **A gun (1)**
- ❍ A flashlight (2)

Desert Pair 4

- ❍ **A parachute (1)**
- ❍ A map (2)

Desert Pair 5

- ❍ **First aid kit (1)**
- ❍ A compass (2)

APPENDIX E:

DEMOGRAPHIC INFORMATION

What is your sex?

- ❍ Male (1)
- ❍ Female (2)

What is your age?

What is your ethnicity (select one)?

- ❍ White (1)
- ❍ Black or African American (2)
- ❍ American Indian or Alaska Native (3)
- ❍ Asian (4)
- ❍ Native Hawaiian or Pacific Islander (5)
- ❍ Hispanic or Latino/Latina (6)
- ❍ Other (7)

What was your overall ACT score? (If you do not know your ACT scores use OASIS: http://oasis.usf.edu/ --> student). If you did not take the ACT leave this section blank.

What was your overall SAT score? (If you do not know your SAT scores use OASIS: http://oasis.usf.edu/ --> student). If you did not take the SAT leave this section blank.

APPENDIX F:

LMX-MDM

I like my leader very much as a person.

- ❍ Strongly agree (1)
- ❍ Agree (2)
- ❍ Somewhat agree (3)
- ❍ Neither agree nor disagree (4)
- ❍ Somewhat disagree (5)
- ❍ Disagree (6)
- ❍ Strongly disagree (7)

My leader is the kind of person one would like to have as a friend.

My leader is a lot of fun to work with.

My leader defends my actions to others, even without complete knowledge of the issue in question.

My leader would come to my defense if I were "attacked" by others.

I do work for my leader that goes beyond what is specified in my job description.

I am willing to apply extra efforts, beyond those normally required, to further the interests of my team.

I am impressed with my leader's knowledge of his/her job.

I respect my leader's knowledge of and competence on the job.

I admire my leader's professional skills.

APPENDIX G:

RATER'S MEASURE OF CONFLICT PROCESSES

Please rate Member A on each of the following items on a scale from 1 (not at all true) to 7 (absolutely true).

Member A tried to investigate an issue to find a solution acceptable to the team (Collab)

Member A tried to integrate my ideas with those of my team to come up with a decision jointly. (Collab)

Member A tried to find a middle course to resolve an impasse. (Collab)

Member A was generally firm in pursuing his/her side of the issue (Compete)

Member A had a "my way or the highway" attitude. (Compete)

Member A refused to hear other team members' opinions. (Compete)

Member A usually engaged in open discussion of differences with the team. (-Avoid)

Member A attempted to avoid being "put on the spot" and tried to keep conflict with the team to a minimum. (Avoid)

Member A gave in to the wishes of the team. (Avoid)

Member A expressed his/her own views directly toward other team members. (Open)

Member A engaged in open discussions of issues in the group. (Open)

Member A openly acknowledge any discomfort or conflict in the group. (Open)

APPENDIX H:
PARTICIPANT MEASURE OF CONFLICT PROCESSES

I tried to investigate an issue with my team to find a solution acceptable to us.

- ❍ Strongly agree (1)
- ❍ Agree (2)
- ❍ Somewhat agree (3)
- ❍ Neither agree nor disagree (4)
- ❍ Somewhat disagree (5)
- ❍ Disagree (6)
- ❍ Strongly disagree (7)

I tried to investigate an issue with my team to find a solution acceptable to us . (Collab)

I tried to integrate my ideas with those of my team to come up with a decision jointly. (Collab)

I exchanged accurate information with my team to solve a problem together. (Collab)

I tried to bring all our concerns out in the open so that the issues can be resolved in the best possible way. (Collab)

I collaborated with my team to come up with decisions acceptable to us. (Collab)

I tried to work with my team for a proper understanding of the problem. (Collab)

I attempted to avoid being "put on the spot" and tried to keep my conflict with my team to myself. (Avoid)

I avoided open discussion of my differences with my team. (Avoid)

I tried to stay away from disagreement with my team. (Avoid)

I avoided an encounter with my team. (Avoid)

I tried to keep my disagreement with my team to myself in order to avoid hard feelings. (Avoid)

I tried to avoid unpleasant exchanges with my team. (Avoid)

I used my influence to get my ideas accepted. (Comp)

I used my authority to make a decision in my favor. (Comp)

I used my expertise to make a decision in my favor. (Comp)

I was firm in pursuing my side of the issue. (Comp)

I used my power to win a competitive situation. (Comp)

I tried to satisfy the needs of my team.

I accommodated the wishes of my team. (Avoid)

I gave in to the wishes of my team. (Avoid)

I allowed concessions to my team. (avoid)

I went along with the suggestions of my team. (avoid)

I tried to satisfy the expectations of my team.

I tried to find a middle course to resolve an impasse. (Collab)

I proposed a middle ground for breaking deadlocks. (Collab)

I negotiated with my team so that a compromise could be reached. (Collab)

I used "give and take" so that a compromise could be made. (Collab)

I tried to keep my communication open in the group. (Open)

I engaged in open discussions of issues in my group. (Open)

I dealt with conflict openly in my work group. (Open)

APPENDIX I:

EXAMPLES OF CONFLICT PROCESSES

The following segments of transcripts are thought to be particularly exemplary of each conflict process. Unless instrumental to the example, Logan's input, any experimenter input, and some irrelevant participant input has been removed. Large removed segments of transcripts are denoted using ellipses. All transcripts have otherwise been copied verbatim, including spelling and grammatical errors.

Example 1:

In this team, Casey shows high levels of competitiveness by repeatedly saying "no" without providing justification and then shows high levels of avoidance by withdrawing from the conversation for an extended period of time. Casey received an average ranking of 5.0 for avoiding, 4.17 for competing, 3.00 for openness, and 2.83 for collaborating. Alex, on the other hand, shows high levels of collaboration and openness by explaining rationale, and trying to find compromises (like at the end when Alex offers to bring the pistol up in ranking). Alex received a 5.33 on openness, a 5.17 on collaborating, a 4.42 on competing, and a 2.43 on avoiding. Bryce received a 4.2 in openness, a 3.92 in collaboration, a 3.75 in competing, and a 3.67 in avoiding.

Casey Team: *pistol should be 5, what if theres a rattle snake*
Alex Team: *sunglasses 6*
Casey Team: *you can kill it before it bites*
Bryce Team: *sunglasses are extremely important*
sandstorms!
Alex Team: *but if we can take care of sun burns and bug bites if we make it 5 for the first aid kit*
Bryce Team: *killing a snake with a gun would be rather hard, I think sunglasses are more important*
Casey Team: *so first aid 7?*
Bryce Team: *yes I agree*
Casey Team: *how will it be hard?*
unles you can aim
cant
Alex Team: *I think it should go 5*
Bryce Team: *5 should be first aid, 6 for sunasses*
Casey Team: *no*
Alex Team: *but we must consider our time is running out*
Casey Team: *NO*
Alex Team: *how about we come back and work our way from the bottom again*
Alex Team: *rain coat shold be 13*

Casey Team: *ok you guys do what you want*
Alex Team: *knife 8*
Alex Team: *We hear you Casey, however, time doesn't permit for us to argue but find a solution everyone can agree upon*
Bryce Team: *mirror is important for sandsorms*
Casey Team: *how?*
Alex Team: *good idea bryce and it can use to start fire*
Bryce Team: *it would a way to communicate with others because radio wouldn't work*
Casey Team: *omg*
Alex Team: *so number 7*
Bryce Team: *\its not completely usless*
Alex Team: *the sun and the mirror can beused to start a fire*
Bryce Team: *flashlight should be 9*
Bryce Team: *we need a way to see in the dark, right?*
Bryce Team: *parachute canbe used to stop the reflection of light*
Alex Team: *because we can use the alcohol to clean a sore*
and dead animals we plan on cooking
Alex Team: *parachute can be 13*
Bryce Team: *good idea*
Casey Team: *yeah the dead animals not killed with a pistol*
Alex Team: *we can spell help with it*
Bryce Team: *but with a jack knife!*
Alex Team: *sorry parachute 1*
12
Bryce Team: *how about the book? its not extremel;y important but still important*
Alex Team: *10 for the book?*
Bryce Team: *we need food*
Alex Team: *11 pistoal*
Bryce Team: *and then pistol 11*
Alex Team: *any final thoughts?*
Bryce Team: *maybe we should switch the mirror for t book*
or bump the book up
Alex Team: *i can see that*
Bryce Team: *do we agree for the book at 7?*
great
I agree with the salt tablets
although it did say that the result of heat cramps was due to los of salts, im not sure if that correspo0nds
Casey Team:
kkkkkkkkkkkkkikkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkk kkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkk kkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkk
Alex Team: *i just dont feel the pistol should be so low*
Logan Team: *Are we all cool with this ranking?*
Casey Team: *no*
Alex Team: *can i switch the pistol with the first aid?*

Casey Team: *thank you alex*
you smart
Bryce Team: *yes*
Casey Team: *whta*
Alex Team: *and change the first aid to, 4*
Casey Team: *so when he says it*
omg
Alex Team: *and coat to 5*
Bryce Team: *overcoat important :?*
;/

Example 2

In this team, all team members, particularly Bryce show higher levels of competitiveness. They shut one another down, they promote their own ideas without attempting to better understand others' points or to find a middle ground. All participants to, however, generally provide justifications and information regarding their own opinions and others' thus scoring high on openness. In fact, Alex scored a 6.33 on openness, a 5.75 on competing, and a 3.83 on collaborating. Bryce scored a 6.5 on competing, a 5.2 on openness, and a 2.33 on collaborating. Casey scored a 6.17 on openness, a 4.42 on competing, and a 4.50 on collaborating. None of the team mates scored higher than a 2.70 on avoiding.

Casey Team: *WAit real quick what is our objective*
arre we trying to walk ut of the desert or get rescued
Bryce Team: *but thats only if you have a heat stroke*
salt will make you dehydrated
i think itcan come later
Casey Team: *becasue that changes things. im under the impression that we are supposed to be rescued*
Alex Team: *no*
Bryce Team: *noe need to walk back*
Alex Team: *a lack of salt CAUSES a heat stroke*
Casey Team: *where does it say we are walking*
Bryce Team: *EXTREME ls of water and salt CAUSES a heat stroke.*
Casey Team: *i feel as though we could wait it out and signal a plane with the flashlight or mirror*
Bryce Team: *water, sunglasses, compass, map*
any suggestions for 5?
Casey Team: *1 water*
Casey Team: *without a doubt*
the next few should be shelter related
we need to get out of the sun
Bryce Team: *no lol we are gonna WALK*
Casey Team: *at least for the day time*
Bryce Team: *not just sit there and wait for someone*
Alex Team: *youre not supposed to walk all day long during the daytime*
Bryce Team: *we will walk during the daaytime*

Alex Team: *did you even read the documents ?*
Casey Team: *youll die if you stay out in the sun*
Bryce Team: *not all day long, but you will*
Bryce Team: *and youll freeze in t night*
Casey Team: *we have overcoat*
Alex Team: *thats why you walk*
Casey Team: *and you wont freeze if you are moving*
Alex Team: *you will get dehydrated easier during the daytime and have to drink more water as a result*
Casey Team: *but you will have a stroke and die in the sun*
Casey Team: *so 1 water*
Alex Team: *1 water*
Bryce Team: *we are half way through and did absolutely othing*
Casey Team: *i think the parachute should be two*
Bryce Team: *congrats team!*
Casey Team: *you can make alot of shade from that*
Alex Team: *why are you so hostile*
Bryce Team: *im not*
Casey Team: *so two parachute*
…
Alex Team: *i feel like knife or pistol should be higher*
Bryce Team: *do you really think mirror is more important than sunglasses*
Casey Team: *if we are in the shade we wont need sunglasses*
like hopefully we just wont see the sun at all
Bryce Team: *no*
Casey Team: *once we get a shelter up*
Bryce Team: *during the day if you literally have to do anything you ave to*
Alex Team: *out of these supplies, we wont have no real shelter*
Bryce Team: *you have to go out to the sun to use thmirror in the first place!*
Alex Team: *i agree with that*
Casey Team: *the parachute can be used easily to be a shelter*
Alex Team: *the mirror is kind of pointless if our plan is to stay covered in the daylight*
Casey Team: *you can just put your hand out or only go if you hear a plane*
Bryce Team: *casey your plan is just too fictional*
you wont stick your hand out
stop trying not to be proven wrong
Alex Team: *raincoat 11*
Casey Team: *okay so put the mirror up more*
Alex Team: *i feel like some of this should be changed but we dont have a lot of time left*
Bryce Team: *can we please switch the miror and sunglasses logan*
Casey Team: *sure im fine with that*
Alex Team: *mirror 9*
sunglasses 8
mirror 11
raincoat 9
Casey Team: *i think this looks pretty good*

Alex Team: *i still feel like we might need a knife or pistol*
Casey Team: *for what though like what could we hunt*
Alex Team: *we will need to eat at some point*
Casey Team: *hopefully we would be out in two days*
Alex Team: *hopefully*
Casey Team: *25 miles a night isnt to bad*
you can go 3 weeks with no food
Bryce Team: *youd be fatigued withno food*
Alex Team: *exactly*
Casey Team: *not as much as you think*
Alex Team: *no one will want to walk 25 miles without eating*
Casey Team: *they will if you dont want to die*
Bryce Team: *casey just thinks she/he is a superhero that lasts two days with no meal and is able to stick his hand out of a parachute shelter*
Casey Team: *bruh*
Alex Team: *omg*
bryce, you good?
Casey Team: *i have been camping for months at a time in the dessert*
Bryce Team: *yeah why*
Casey Team: *liek i know about this*
Alex Team: *are you a survivalist bc you have questioned literally everything everyone has said*
Casey Team: *who?*
Alex Team: *bryce*

Example 3:

In this team, Alex and Bryce often actively seek input from Casey when confronted with decisions, reflecting high levels of collaboration. The team members also present their ideas as negotiable (e.g., as questions) rather than as unjustified statements, also reflecting high levels of collaboration. Bryce and Casey also both refer directly to the pdf resources showing higher levels of openness. The participants received the following ratings: Alex received a 5.42 on openness and a 5.83 on collaborating, Bryce received a 5.75 on openness and a 6.17 on collaborating, and Casey received a 4.83 on avoiding, a 3.50 on both openness and collaborating. None of the team mates received higher than a 2.5 on competing.

Alex Team: *okay well we know from those that water is essential to survival and it's also important to be protected from the sun with clothes*
Bryce Team: *Casey. speak up if you feel something should be in a different order*
Casey Team: *I will*
Bryce Team: *the one article put emphasis on covering up while in the desert.. so even though an overcoat seems hot.. its probably useful af*
Alex Team: *agreed*
Casey Team: *For the cold nights as well*
Casey Team: *Water,First aid, Sunglasses, air map, overcoat. I'm not a survivalist expert so i'm most likely wrong.*
Bryce Team: *i dont think any of us are survivalist haha :) h2o, salt, map, knife, compass*

Alex Team: *water, overcoat, first aid kit, map, sungasses*
Bryce Team: *so what about you logan?*
Alex Team: *logan can't say*
Bryce Team: *o*
Bryce Team: *1-5 first*
Alex Team: *okay water first for sure right guys?*
Bryce Team: *i think its safe to say we all need water*
cha
Alex Team: *good old h2o*
Bryce Team: *we need that sodium chloride too for water retention and keep from heat stroke*
Alex Team: *and second do you guys think it should be over coat or first aid???*
Bryce Team: *mmmmm overcoat*
casey?
Alex Team: *okay and I agree that salt should make top 5*
Casey Team: *I'd say first aid*
Alex Team: *and first aid kit is important too*
Bryce Team: *ok first aid for 2*
Alex Team: *first aid fo2*
and then over coat 3
Bryce Team: *overcoat for 3*
map for 4?
Alex Team: *yep*
Casey Team: *sunglasses*
Casey Team: *the heat heat affects your vision*
Alex Team: *sunglasses are also really important*
Bryce Team: *sunglasses for what number casey?*
Alex Team: *maybe put them for 5*
and salt for 6
Bryce Team: *sounds good to me, just remember salt is like our equiv to food in the desert*
Casey Team: *sun**
Alex Team: *how do you guys feel about the compass?*
Bryce Team: *compass should be 7*
Alex Team: *okay casey?*
Casey Team: *yeah*
Bryce Team: *maybe the liquor shouldve been first because after a plane crash I might need a drink.. js*
Alex Team: *AYEEEEE*
i feel that
Bryce Team: *haha pistol for 8?*
Casey Team: *yes*
…
Alex Team: *should the map be higher?*
Bryce Team: *i had map at like 3*
but we almost out of time
casey?

Casey Team: *it said drink water. I was looking at the pdf carefully for that specific reason of water retention but it really doesn't say salt is beneficial anywhere in the pdfs*
Alex Team: *I think it should switch with overcoat*
Casey Team: *same]*
Alex Team: *map 3 overcoat 4*
Bryce Team: *read resource two, it tells you how heat exhaustion, stroke.. etc is secondary to loss of h2o and NaCl*
im fine with that map and overcoat switch
Alex Team: *are we good team?*
Bryce Team: *si*
Casey Team: *yeah it says water for all of them but ok*
yeah.3
Alex Team: *I believe so*

APPENDIX J:

TEAMMATE AND LEADER SATISFACTION

I like my peers on my team.

- ❍ Strongly agree (1)
- ❍ Agree (2)
- ❍ Somewhat agree (3)
- ❍ Neither agree nor disagree (4)
- ❍ Somewhat disagree (5)
- ❍ Disagree (6)
- ❍ Strongly disagree (7)

I find I have to work harder at my job than I should because of the incompetence of my peers on my team.

There is too much bickering and fighting among my peers on my team.

I enjoy the peers on my team.

My team leader is quite competent in doing his/her job.

My team leader is unfair to me.

My team leader shows too little interest in the feelings of subordinates (myself and my peers).

I like my team leader.

APPENDIX K:

JOB AFFECTIVE WELLBEING SCALE

For the following questions, think of your experiences working with your team on the Desert Survival task. How much did you experience each emotion

		1- None at all (1)	2 (2)	3- A little (3)	4 (4)	5- A moderate amount (5)	6 (6)	7- A great deal (7)
1HPLA	At ease (1)	❍	❍	❍	❍	❍	❍	❍
2LPHA	Angry (2)	❍	❍	❍	❍	❍	❍	❍
3	Annoyed (3)	❍	❍	❍	❍	❍	❍	❍
4LPHA	Anxious (4)	❍	❍	❍	❍	❍	❍	❍
5LPLA	Bored (5)	❍	❍	❍	❍	❍	❍	❍
6	Cheerful (6)	❍	❍	❍	❍	❍	❍	❍
7HPLA	Calm (7)	❍	❍	❍	❍	❍	❍	❍
8	Confused (8)	❍	❍	❍	❍	❍	❍	❍
9HPLA	Content (9)	❍	❍	❍	❍	❍	❍	❍
10LPLA	Depressed (10)	❍	❍	❍	❍	❍	❍	❍
11LPHA	Disgusted (11)	❍	❍	❍	❍	❍	❍	❍
12LPLA	Discouraged (12)	❍	❍	❍	❍	❍	❍	❍
13	Elated (13)	❍	❍	❍	❍	❍	❍	❍
14HPHA	Energetic (14)	❍	❍	❍	❍	❍	❍	❍
15HPHA	Excited (15)	❍	❍	❍	❍	❍	❍	❍
16HPHA	Ecstatic (16)	❍	❍	❍	❍	❍	❍	❍

17HPHA	Enthusiastic (17)	❍	❍	❍	❍	❍	❍	❍
18LPHA	Frightened (18)	❍	❍	❍	❍	❍	❍	❍
19	Frustrated (19)	❍	❍	❍	❍	❍	❍	❍
20LPHA	Furious (20)	❍	❍	❍	❍	❍	❍	❍
21LPLA	Gloomy (21)	❍	❍	❍	❍	❍	❍	❍
22LPLA	Fatigued (22)	❍	❍	❍	❍	❍	❍	❍
23	Happy (23)	❍	❍	❍	❍	❍	❍	❍
24	Intimidated (24)	❍	❍	❍	❍	❍	❍	❍
25HPHA	Inspired (25)	❍	❍	❍	❍	❍	❍	❍
26	Miserable (26)	❍	❍	❍	❍	❍	❍	❍
27	Pleased (27)	❍	❍	❍	❍	❍	❍	❍
28	Proud (28)	❍	❍	❍	❍	❍	❍	❍
29HPLA	Satisfied (29)	❍	❍	❍	❍	❍	❍	❍
30HPLA	Relaxed (31)	❍	❍	❍	❍	❍	❍	❍

APPENDIX L:
IRB APPROVAL LETTER

USF
UNIVERSITY OF
SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

10/2/2017

Keaton Fletcher, B.A., B.S.
Psychology
8931 Iron Oak Ave.
Tampa, FL 33647

RE: **Expedited Approval for Initial Review**
IRB#: Pro00032426
Title: Relative LMX in Teams

Study Approval Period: 10/2/2017 to 10/2/2018

Dear Ms. Fletcher:

On 10/2/2017, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):
Protocol Document(s):
IRB Protocol ver1. 9-5-17.docx

Consent/Assent Document(s)*:
SB Adult Minimal Risk 9.6.2017.docx.pdf

***Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab.** Please note, these consent/assent documents are valid until the consent document is amended and approved.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board

APPENDIX M:

EXPERIMENTER SCRIPT

BEFORE PARTICIPANT ARRIVAL:

1. **Sign in to as many computers as necessary**
2. **Load qualtrics survey on every computer: http://bit.ly/2gJkX4e**
3. **Lay out informed consent forms at each computer**
4. **Lay out scratch paper and pen at each computer**
5. **Prepare the correct number of Participant ID slips**
6. **Prepare correct number of Team/Email slips**
7. **Prepare the correct number of tickets**
8. **Make sure room divider between 2121 A & B is closed and locked**
9. **Make sure you have a dice ready in case you need to send people home**
10. **Put experiment sign on outside of door**

Bold: Say this

Italics: Do this

Upon participant arrival. **"Hello, thanks for coming are you here for Lab 1066? What is your name?"**

Check them off on the attendance sheet

"Great. Please take a seat in front of a logged on computer while we wait for others to arrive. "

Pass out ID slips Make sure confederates get a pre-assigned ID slip and that you write down what the confederate IDs will be. **"You have been given your randomly assigned participant ID. Hold onto that, you'll need it throughout the study. In front of you is an informed consent document, please read it over and sign it if you agree to participate. If you have questions or choose to not participate, please let me know."**

If, five minutes into the study, you don't have a number of non-confederate participants divisible by 3 (e.g., 3, 6, 9, 12, etc.) you must send people home until you do. Have participants take turns raising their hands. As they raise their hands, roll a dice for each one until you roll a 4. If you roll 4 for them, thank them, send them home, and tell them they'll receive their full points.

If participants try to arrive more than 5 minutes late, let them know that the study has begun but that they can sign up for a future time slot. Make note of who was late so they can be allowed to sign up again.

Collect informed consent from remaining participants.

Once everyone has arrived and signed informed consents (up to 5 minutes after the scheduled start time.) "**Thanks everyone for coming. My name is _____ and these are my fellow experimenters, _____ and _____. To make sure everyone receives the same information, we will be reading from scripts. This may be a bit awkward, so we apologize in advance. Please take a moment to turn off your cell phones, you will not be allowed to talk to other participants, use your cell phones, or browse the internet for the remainder of the study.**

Today you're going to be working in teams of four. One of you will be an assigned leader and the other three will be working for the leader. Your team is playing the part of a scientific consulting team. Your two tasks today are like those used to estimate the critical thinking skills of other scientific and action teams like NASA and the US Army. So when you're working together, really try to think of it as if it were a job. That said, you'll actually have a chance to win money on top of your SONA points.

Each leader will be given three tickets to distribute to the other three members based on the leader's perceptions of who participated the most and most effectively. Each ticket will give you a chance to win a $50 drawing when the study is completed. But also try to do your best because your leader will be counting on you. Leaders of teams will be rewarded based upon their teams' performance. The better the team does, the more the leader gets paid."

To determine who will be the team leader, you will be first completing a survival knowledge test. Since we have _____ many people here today, that means we will have _____ teams. So the _____ of you with top scores will be the leader. Go ahead and enter the ID you've been given and then finish the test. When you have finished the test, please raise your hand. Once all of you have finished, we'll grade your responses online. While we do that up here, you all should move on to the next portion of the study and fill out a few baseline measures.

Wait until everyone has moved onto the surveys.

While one experimenter signs the informed consent documents, another should:

Pretend to grade scores. RE-WRITE DOWN IDS OF CONFEDERATES. THEN READ THOSE IDS OUTLOUD.

If you have one of the IDs I just read out loud, congratulations. You scored the highest on the survival knowledge test, showing the best levels of relevant critical thinking. Therefore, you'll be the leaders of the teams. Please finish your surveys, pick up your pen, your ID slip, and your scratch paper then come take the tickets you will be able to distribute to your team as you see fit at the end of the study. Then, step out into the hall with _____ where (s)he'll walk you to your leader lounge. (S)he'll also give you further instructions.

Give confederates 3 tickets each. Wait for confederates and experimenter to leave the room.

OK. The rest of you are going to be randomly assigned to teams. The experimenter will come around and assign you a Team ID, a participant letter, a code name, and an anonymous email.

Go around with the cup filled with email/team id slips, and let participants select them randomly.

OK. A's should all stay here. B's go with _____ to another room. C's go with _____ to another room. Please bring your scratch paper, your participant ID slip, your team ID slip, and pen when you move.

Let all of the participants leave. Bring the Bs and Cs to their respective rooms (PCD 2122, PCD 2121A). Have them sign onto computers and open either Chrome or Explorer.

Within all rooms, make sure participants are seated with at least 1 computer between them.

OK. You are all the A/B/C's in your respective teams. During your communications with your team, to keep you anonymous, but to give you a human feel, we need you to introduce yourself as ALEX/BRYCE/CASEY to your team. Do not ever reveal your actual gender or sex, but you can reveal any other true facts about yourself.

First, I need you all to go to mail.google.com. When prompted to sign in, enter your assigned email from the slip you drew randomly. The password is "Package55". This password is also on the slip that you drew.

Help out whoever needs help.

Now that you're in gmail, you should have an email titled "Survey Link." You may need to check the spam folder. Please open that email, click on the link, and it will take you to your next set of surveys. But don't start yet. When you've done that, open a new tab. If you need help opening a new tab, please let me know.

Wait for a hot second

Next, in your new tab, I need you all to go to drive.google.com. Now that you're in google drive click on "shared with me." You'll see a folder with your Team number, so for example, "Team 1."

Wait for a hot second

If you open that folder, you'll see two folders, titled "Scenario 1" and "Scenario 2." Click on the folder, "Scenario 1." Within Scenario 1, you will see a google doc titled "Scenario 1 workspace." You'll also see three pdf resources. These are resources to help you with the task.

Wait for a hot second

Your teammates all also have access to the task workspace and the resources. However, only the leader is actually able to edit the google doc.

Before working with your team on the task, you're going to be asked to complete the task on your own. You have 10 minutes to read through the task instructions and any of the three resources you choose to use. Please do not start until I tell you to do so.

As you do this, write down your final rankings on your scratch piece of paper. You'll then make your rankings in the qualtrics survey, by clicking and dragging the items to their desired ranking. During this period, do not use the chat function in the google doc. You can still use the PDFs, though. Again, be sure to write down your rankings on your scratch piece of paper because once you submit your rankings in the qualtrics survey, you will be unable to view your answers during the team portion of the task. You can also write any other notes you prefer on your scratch pieces of paper. Be sure to label each piece of scratch paper with your participant ID, your team ID, and your participant letter, which is A/B/C. Any questions? Your 10 minutes begins now.

Start timer. Wait 9 minutes.

You have 1 minute remaining. Please use qualtrics survey to make your final rankings. Please do not move on once you see the stop sign.

Wait 1 more minute

Your time is up. Has anyone not made their final rankings?

Help them figure it out if they don't know.

Please return to the google doc. In the upper right, click "message bubble icon" This should open a pop up window that will allow you to chat with your team to coordinate your answers. If you need help finding the Chat button, please raise your hand. Once you're in the chat, let your teammates know you're done with the individual portion of the task and are ready for the team portion. Your team leader will keep track of your time once your whole team is logged on.

Wait 20 minutes.

Your teams should be wrapping up in the next few minutes. When you finish, the experimenter in the leader room will grade your team's performance. While that is happening, feel free to chat to your team, but do not open other documents, do not talk to others in this room, and do not open up other browser windows or use your phones. When your leader has told you that your team is ready to fill out surveys, please raise your hand.

As they raise their hands, guide them to the qualtrics survey.

When you have finished your surveys, please raise your hand to let me know you've finished, then wait quietly for further instructions from me.

Wait until everyone has raised their hands.

OK that first round was mostly for practice. The next task which is very similar is the one which will determine the amount of money your leader will earn. Remember you are working as part of a scientific consulting team and your performance on these tasks is supposed to indicate your team's scientific reasoning ability.

Wait for a hot second

Please go back to google drive you'll see a folder titled "Scenario 2" If you open that folder, you'll see a link to a google doc called "Scenario 2 workspace." You'll also see three pdf resources. These are resources to help you with the task.

Wait for a hot second

Your teammates all also have access to the task workspace and the resources. But first, you're going to be asked to complete the task on your own again. You have 10 minutes to read through the task instructions and any of the three resources you choose to use. You'll then make your rankings in the qualtrics survey. Be sure to write down your rankings on your sheet of paper so you have access to them during the team portion of the task.

Wait for a hot second

During this period, do not use the chat function. Again, be sure to write down your rankings and any notes from your rankings or pdfs on your sheet of paper. You can, also make notes or write things down on your scratch paper. Just label each page with your participant ID, your team ID, and your participant letter, which is A. Your 10 minutes begins now.

Start timer, wait 9 minutes.

You have 1 minute remaining. Please use qualtrics survey to make your final rankings.

Wait 1 more minute

Your time is up. Has anyone not made their final rankings?

Help them figure it out if they don't know.

Please return to the google doc. In the upper right, click "Chat" This should open a pop up window that will allow you to chat with your team to coordinate your answers. Let your teammates know that you have finished the individual task and are ready for the team portion. Your team leader will tell you when your 20 minutes begins.

Wait 20 minutes.

Your teams should be wrapping up in the next few minutes. While the experimenter in the leader room grades your team's performance, feel free to chat to your team, but do not open other documents, do not talk to others in this room, and do not open up other browser windows or use your phones. When your leader has told you that your team is ready to fill out surveys, please raise your hand.

As they raise their hands, guide them to the qualtrics survey.

When you have finished your surveys, please raise your hand to let me know you've finished. Then, please wait quietly until everyone has finished at which point I will debrief everyone at the same time.

Wait until everyone has raised their hands.

Thank you for participating in this study. Before you go, we need to ask you a few questions and then debrief you.

On your scratch piece of paper, please answer the following questions.

1. At this time, do you have any questions about the study? If yes, what are they?

Wait for a hot second

2. Was there anything suspicious to you in this study, its procedures, or its purpose? If yes, what?

Wait for a hot second

3. Are you able to guess what the study is about? If yes, what is your guess?

Wait for a hot second

4. What is your reaction to the study?

Wait for a hot second

5. Had you heard anything about the study from previous participants?

Wait for a hot second

Thank you for answering these questions. Your leader was a confederate, meaning that their behavior was scripted as part of the study. They were instructed to create strong relationships with all, some, or none of you. Additionally, your leaders did not actually have the power to distribute the tickets as they saw fit, you all have an equal chance to win the drawing. Since you could not give complete consent prior to completion of the study, you now have the opportunity to request that your data be destroyed. If you would prefer that, please let me know. If you are upset from your leader's behaviors and believe you need something to raise your mood let me know, we have a soothing video you can watch *(on the drive shared with your personal email)***. Or if you need information about student counseling services for any potentially lasting issues, please let me know and we can give you information for campus mental health services.**

Hand each participant one ticket.

If you are OK, then please write your email address down on your ticket, to be entered into the drawing. Then, return your ticket, your scratch paper, and your ID cards to me. You will be emailed if you win the drawing.

Enter IDs into spreadsheet "Emails, participant conditions for dissertation"

APPENDIX N:

RESOURCES FOR LUNAR AND DESERT SURVIVAL TASKS

Below is listed the content of the resources participants were given. Resources were stylized PDFs of curated content from blogs, websites, and books, designed to look like a single pdf. The content of each resource is clarified such that the original source of the material is linked (or cited) along with the associated paragraph or pages. If no paragraph or page number is given, then the entire original source was used.

Resource 1. The Surface of the Moon: From Dust to Mountains

https://www.cliffsnotes.com/study-guides/astronomy/earth-and-its-moon/properties-of-earth-and-the-moon- paragraph 3

https://phys.org/news/2012-07-moon-toxic.html- paragraphs 1-5

https://www.space.com/26576-apollo-11-moon-landing-risks.html- paragraphs 1 & 2

https://www.universetoday.com/62140/surface-of-the-moon/- paragraphs 6-10

Resource 2. What it's like on the moon. 6 Questions with Expert Answers

1. **Can you fire a gun on the moon?**
   http://curious.astro.cornell.edu/physics/44-our-solar-system/the-moon/general-questions/107-can-you-fire-a-gun-on-the-moon-intermediate
2. **Signal Flare in Space**
   https://helios.gsfc.nasa.gov/qa_sp_ev.html- point 7
3. **Sparks in Space**
   https://helios.gsfc.nasa.gov/qa_sp_ev.html- point 8
4. **Will a Simple Magnet Work in Space?**
   https://helios.gsfc.nasa.gov/qa_sp_ev.html- point 9
5. **Will a Compass Work in Space?**
   https://helios.gsfc.nasa.gov/qa_sp_ev.html- point 10
6. **How would maps work in space?**

https://timeandnavigation.si.edu/multimedia-asset/star-chart

Resource 3. Eating in Space

https://www.esa.int/esaKIDSen/SEMBQO6TLPG_LifeinSpace_0.html

https://www.nasa.gov/audience/forstudents/postsecondary/features/F_Food_for_Space_Flight.html - paragraphs 26 and 27

Resource 4. **26 Tips for Surviving in the Desert**
https://www.desertusa.com/desert-activity/desert-survival-tips.html
Resource 5. **Desert Survival Guide**
Larson, M. U.S. (2017) Army Survival Handbook, Revised. pages 208-210

Resource 6. **Desert Survival Information**
https://www.seeker.com/desert-survival-8-simple-tips-that-could-save-your-life-1765446737.html