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Leading Together: Exploring Conditions for Shared Leadership Emergence in Teams

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by

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Abstract

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Modern workplaces require complex teamwork and leadership behaviors to innovate and achieve their goals effectively. Research has found that one of the best ways to help improve team collaboration and performance is to foster shared leadership across the team members. However, little research has been conducted to determine what factors actually drive the emergence of shared leadership in teams. This archival study examines the possible factors and pathways that lead to shared leadership emerging within teams. The data from sixty-six (66) three-person teams was used. Each team member had to collaborate to successfully complete a simulated spaceship bridge task. Six hypotheses were tested at the team-level. The results suggest that surface-level diversity negatively impacts the emergence of shared leadership, whereas a team's positive perceptions of its own internal environment positively relates to the emergence of shared leadership. It was also found that reductions in perceptions of team internal environment fully mediates the relationship between surface-level diversity and shared leadership emergence. Implications for research and practice of these findings are also discussed.

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Acknowledgements

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Introduction

Rapid changes in technology and the compounding strategic and economic pressures of globalization have driven the design of organizational work to focus on team-based structures (Lawler, Mohrman, & Ledford, 1995). Teams are often defined as a collection of individuals who are (1) task interdependent, (2) share responsibility for joint outcomes, and (3) see themselves as an intact social entity (Cohen & Bailey, 1997). Organizations worldwide have adopted team-centric structures with limited hierarchy to the point where teams are pervasive; the rule, rather than the exception. Teams are overwhelmingly integral to organizational effectiveness and the clear majority of organizations with 100 or more employees utilize teams to perform critical work (Cohen & Bailey, 1997; EY, 2013). Furthermore, global business relies on global teams for organizational success and growth (EY, 2013). In a recent survey, 85% or more of employees in multinational organizations are part of teams with members based in different locations worldwide (RW3 CultureWizard, 2016). There is a critical imperative for organizations to develop and maintain the capability and long-term viability of their teams. This is especially critical as teams become increasingly diverse in every possible way and teams must leverage that diversity to solve increasingly complex problems.

Teams composed of diverse, engaged members are sources of new ideas and innovation, and are critical resources in the highly competitive, globalized economy (Kearney & Gebert, 2009). Diverse teams also pose challenges and

hurdles if poorly managed, falling into downward spirals of dysfunctional conflict and competitive subgroup fault lines (Gibbs & Boyraz, 2015). Further, benefits of diversity, such as creativity and innovation, cannot emerge unless teams are composed thoughtfully and trained to more effectively work together (Harvey, 2013). Therefore, identifying methods for encouraging the positive benefits that can result from diverse individuals and thought, while reducing the potential conflicts and isolation, is key to continuing to build the capacity of teams and organizations.

Decades of research has found that effective, engaged leadership is, perhaps, the most important ingredient to reducing the likelihood that teams fail in a number of ways (Zaccaro, Rittman, & Marks, 2002). Team leadership is significantly, positively related to most other team processes identified by researchers (Burke et al, 2006, Zaccaro et al., 2001). Leadership is integral because it shapes and directs team efforts and collective norms (Mehra, Smith, Dixon, & Robertson, 2006). Determining how a team's internal leadership develops, then, is critical to continuing the improvement of team performance and affective outcomes, especially for diverse teams (Wildman & Griffith, 2015).

In the past decade, scholars have begun to examine shared leadership within teams as a competitive advantage that can improve team performance above and beyond that of traditional team leadership that is derived from a single source (Carson, Tesluk & Marrone, 2007; Wang, Waldman, & Zhang, 2014). Multiple findings suggest that shared leadership can help teams work together and become

more adaptable, integrate multiple perspectives into cohesive outputs (Kozlowski, Watola, Nowakowski, Kim, & Botero, 2009), and overcome the downsides of diversity in teams (Hoch, 2014). Compared to the traditional view of leadership as residing within only a single individual within or outside the team, the shared leadership perspective posits that leadership can be distributed across multiple individuals. Researchers have defined shared leadership as an emergent process of mutual influence between team members (Small & Rentsch, 2010) and as an emergent team property (Carson et al., 2007) in which leadership influence is distributed across multiple team members.

Research into shared leadership has generally been focused on outcomes. Few studies have specifically examined the antecedents of shared leadership, and almost no studies have examined the impacts of team diversity on the emergence of shared leadership in groups, even though evidence suggests that when shared leadership exists it enhances outcomes more for diverse teams than homogenous teams (Hoch, 2014). What little research exists has found that diversity may impact the emergence of shared leadership. Specifically, Mendez and Busenbark (2015) found that mixed gender teams are less likely to exhibit shared leadership. Other research has found that collocated action teams with highly international members were much less likely to share leadership and especially those teams with large differences in cultural values like power distance (Scott, Fry, Jiang, Pagan, & Wildman, 2016). This negative relationship between team diversity and shared leadership is especially problematic given the strong performance enhancements

that shared leadership can bring diverse teams (Hoch, 2014). Team compositional characteristics like personality, culture, and demographic heterogeneity might be driving this reduced shared leadership emergence by impacting the team's perception of and reaction to each other.

Carson and colleagues (2007) argue that a team's internal team environment is critical to successfully fostering shared leadership within a team. Team members must feel a sense of shared purpose, socially supported, and that they can participate and provide input in directing the team (Carson et al., 2007). Social identity theory (SIT; Tajfel & Turner, 1986) posits that the more similar individuals are, the more likely they are to self-categorize themselves as part of the same 'in-group'. People who view themselves as part of the same in-group are more likely to develop the internal team environment related to shared leadership emergence. Individuals who view each other as part of the same in-group feel more positively towards their (in-group) team members and have more trust in them (Wildman, Shuffler, Lazzara, Fiore, & Burke, 2012), and feel more comfort within the (in-group) team. In short, perceiving others as part of the same group you belong to increases a perception of belonging with those others and increases the comfort you have with that group, improving perceptions of the team's internal environment. Further, these perceptions might be modified by team processes early in the lifespan of the team. From team inception to team termination, team processes iteratively build upon each other to create and reinforce the common culture, expectations, and perceptions of a team's membership which, in turn, impact

subsequent processes and performance (Marks, Mathieu, & Zaccaro, 2001). The iterative nature of these effects suggests that early interventions, training, or guidance can set up teams for success (Marks et al., 2001). One way teams work towards building shared identity and positive emergent states is through interpersonal rapport building as they negotiate their new status as group (Kozlowski & Bell, 2003; Pullin, 2010). Identifying the impact of this team socialization process on developing positive emergent states and shared leadership could give teams and organizations tactics that can be used to develop and coach these beneficial outcomes early in a team's lifecycle.

This study attempts to dissect the impact of a team's composition and properties (e.g., team orientation; Driskell, Salas, & Hughes, 2010) and other characteristics of demographic and cultural diversity, alongside trainable, individualized team socialization processes on the emergence of a positive team environment which promotes shared leadership emergence and team outcomes. To this end, this study used a controlled laboratory-based simulated team setting wherein teams of individuals come together to collaboratively achieve the goals using a virtual platform called Artemis. Artemis is a spaceship bridge simulator, in which each individual must take on a specific role and responsibilities. These individuals must work together, collaborating and communicating, to successfully achieve their teams' missions. Previous research has found this platform to be effective in allowing a controlled study of team processes and the emergence of team emergent states and shared leadership (e.g., Scott, 2014). Within this setting,

team interactions and perceptions on the team were recorded through a combination of coding individual and team behaviors and individual responses to survey questions. By identifying the impact of these factors on the emergence of shared leadership, this study advances our understanding of diverse team performance and shared leadership emergence.

In addition to research implications, there are several practical implications for the current research. First, the results provide actionable information to organizations and managers about how to best compose teams that encourage the emergence of shared leadership. More specifically, this study hopes to show that organizations and managers should select team members that are high in team orientation. Second, given that composing the ideal team is often not within the control of an organization, this study investigates whether effective socialization behaviors early in the team's lifespan may also contribute to the development of shared leadership by creating the positive team internal environment already known to be a predictor of shared leadership, especially in diverse teams.

Literature Review

Teams

The human ability to collaborate is a major cause of our survival and success as a species (Melis, 2013). The clear majority of work performed in daily life, whether at home, in our communities, or in the workplace, is performed in collaboration with other individuals (Cohen & Bailey, 1997). In short, most of our lives we spend working in teams, whether explicitly formed or not. Teams as commonly defined as a collection of individuals who are task interdependent, who share responsibility for joint outcomes, and who see themselves as an intact social entity (Cohen & Bailey, 1997). Organizations have been driven by rapid technological and societal changes, economic pressures, problem complexity, and global competition to re-design workflows to create collaboration and restructure organizations into hierarchically flat, highly empowered "teams of teams" (Deloitte, 2016; Lawler, Mohrman, & Ledford, 1995). Not only are teams almost uniformly present in the modern economy (van Mierlo, Rutte, Vermunt, Kompier, & Doorewaard, 2007), they are characterized by increasing complexity. In a recent study of global multinational companies, 85% of respondents reported that their companies used teams whose membership was composed of individuals from all over the world (RW^3 CultureWizard, 2016). However, this shift towards team-based structures seems to be a return to normal in the aftermath of the Industrial Revolution, rather than a completely new way of completing work.

Contemporary teams. Contemporary teams are self-managed (Moorhead, Neck, & West, 1998) and autonomous, with increasing decision-making power over their own tasks, workflows, and missions (Deloitte, 2016; Moorhead et al., 1998). Using team-based work structures instead of individualized work structures better matches the challenge of managing the complexity and variety of the problems facing organizations today. Research also shows that team-based work has tangible benefits for employees (e.g., quality of work life, satisfaction with their jobs, feelings of well-being, fulfilled growth and achievement motivations, and increased organizational commitment; Kirkman & Rosen, 1999). The birth of the contemporary self-managing team in corporate America began with the introduction of quality circles that U.S. manufacturers and companies adopted from Japan (Tang & Crofford, 1996) These quality circles worked to involve employees in solving problems and improve work efficiency, safety, and other processes (Tang & Crofford, 1996).

Since the advent of quality circles, teams have become more autonomous and collaborative as organizations struggled to continually improve performance, productivity, and innovation. Where previous work groups often had very clear lines of leadership and strong organizational expectations regarding a chain of command (Fayol, 1949) the days of "Unity of Command" are over. Today's teams are expected to engage heavily in peer-directed, role-making interactions (Seers, Petty, & Cashman, 1995) as the roles of leader and follower are not always clear. This is particularly true of teams which are comprised of functional experts who

have great latitude in shaping their own roles and interactions with their fellow team members. This increased interaction complexity and ambiguity coupled with the velocity of the modern economy makes the importance of leadership in teams more evident. Accordingly, research has begun to explore the idea of leadership as an emergent property created by the collaboration, communication, and interaction of team members rather than a hierarchical role or top-down behavior (Carter, DeChurch, Braun, & Contractor, 2015; Scott, Jiang, Wildman, & Griffith, 2017).

Team Outcomes. Although team outcomes are often measured in terms of team performance outcomes (e.g., quality or quantity metrics), these outcomes are often impacted by external factors teams largely have no control over (Mathieu, Maynard, Rapp, & Gilson, 2008). For example, if a team was engaged in negotiations to acquire a company that later burned down and lost everything, that team has not achieved its goals (i.e., acquire the company and its assets) yet the reason for that outcome is through no fault of their own. Therefore, it is more reasonable to holistically examine specific teamwork outcomes (including team performance). Team outcomes are the product of teamwork processes and emergent states (Mathieu et al., 2008). There are generally three categories of outcomes: team performance (e.g., team effectiveness), team attitudes, and team behaviors (Beal, Cohen, Burke, & McLendon, 2003; Mathieu et al., 2008).

Whereas team performance outcomes are objective indicators of how well a team actually achieved their goals (Mathieu et al., 2008), team attitudinal outcomes can largely be understood as the impact working together has on a team's affect and

viability. These include constructs such as team affective reactions to performance (e.g., how working with the team makes team members feel, how satisfied the team is with their work, how they perceive the atmosphere of the team), and the team's long-term viability, which can be defined as team membership stability over time and the desire of individuals to remain as members of the team (Barrick, Bradley, Kristof-Brown, Colbert, 2007). In truth, it is nearly impossible to separate measures of a team's affective reactions with a team's viability because affective events trigger long term cascades of behavior and can trigger positive and negative feedback cycles (Weiss & Cropanzano, 1996).

Team behavioral outcomes refer to the quality of the behavioral processes that were enacted to reach goals (e.g., the acceptability or success of a team's level of adaptability, feedback seeking, or communication). The difference between team performance outcomes and team attitudinal and behavioral outcomes can be seen in terms of proximity and directness. Behavioral and attitudinal process and emergent state outcomes are more proximal to actual teamwork than team performance outcomes and they directly measure how well a team is working together directly by tapping the processes and emergent states that occur throughout the teamwork cycle.

Team Processes and Emergent States

The model of team performance has needed to keep pace with changes in team structure and tax complexity. The most common and useful framework for modeling team performance is an update made by Ilgen, Hollenbeck, Johnson, and

Jundt (2005) to McGrath's (1964) input-process-output model (IPO). McGrath's IPO model focuses on team inputs, processes, and outputs. Inputs are antecedents that can act as enhancements or constraints for team processes (e.g., informational and physical resources, previous performance or experience with the team, compositional variables). Team processes are how a team transforms these inputs into the outcomes or outputs desired by the team or the organization. Ilgen and colleagues' framework is a better fit for examining the modern work team in two ways.

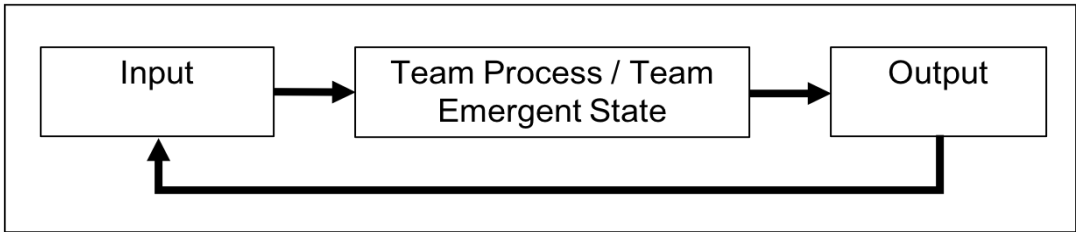

Figure 1 – Adaptation of the Ilgen et al. (2005)'s IMOI Model

First, the model specifically calls out the reciprocal temporal pattern of team performance wherein the outcomes of a previous performance cycle feed back into the model as new inputs. Secondly, team processes are separated from team emergent states which refer to the cognitive, motivational, or affective states that are created through the interaction between the team's inputs and teamwork processes (Marks, Mathieu, & Zaccaro, 2001). In short, team processes are the actions teams undertake to transform inputs into outputs and emergent states are what teams think or feel during (and after) those processes. Ilgen and colleagues

labelled this segment of the model as a broader grouping of team mediators. While processes and emergent states both transform team inputs into team outcomes, they do so in different ways. Given that processes are behavioral, they can be trained. However, team emergent states are less observable, and therefore harder to directly manage. In the following sections, I discuss specific kinds of behavioral teamwork processes helpful in building team effectiveness and introduce a specific type of team emergent state: the team internal environment.

Team leadership. Leadership and leaders are highly important extensions of highly collaborative, team-based social structures: these are ubiquitous and universal in human society (Van Vugt, Hogan, & Kaiser, 2008). It is entirely possible that more ink has been spilled discussing leadership than any other human topic. From the ancient Greeks and Chinese, through Galton (1869), for the majority of human history interest in the traits and behaviors of leaders (and what "effective" leadership looks like) has focused on the "great men" of history (Carlyle, 1907). The great man theory of leadership posed that heroic individuals arise with extraordinary gifts and capacity for leadership that others cannot possess (Galton, 1869). Though the idea of leadership as solely the province of great men now seems archaic in our self-empowered age, the perspective led researchers and scientists to focus on exactly what specific traits and behaviors led to the emergence of leaders and the effectiveness of their leadership.

While there are many different theories and definitions of leadership (thanks to our scattered exploration of the topic), with little consistency across them

(Chemers, 1997), at its most basic, leadership is "the process of using social influence through which one person enlists the aid and support of others to accomplish a common task" (Scott, 2014, pp. 10). Leadership, in the end, is behavioral and not merely role based (e.g., great men). This perspective allows the possibility for multiple sources of leadership within a team, often occurring simultaneously (Scott, Jiang, Wildman, & Griffith, 2017). However, the majority of research done has focused on the emergence and effectiveness of individual leaders (Judge, Piccolo, & Kosalka, 2009). A wealth of research exists regarding an individual's emergence as a leader and that individual's traits. These traits are highly stable over time (Epitropaki & Martin, 2004; Lord & Maher, 1993) and can lead to leadership emergence through two pathways: perceived leadership emergence and role-based leadership emergence (Judge et al., 2009). These two pathways are mutually reinforcing, in that people who are perceived as being leader-like or who can encourage peers to nominate them as leaders (e.g., perceived leadership emergence) are more likely to eventually occupy an actual leadership position in an organization or group (i.e., role-based leadership emergence).

Perceived leadership emergence is highly based upon the match between an individual's traits and behaviors and the leadership needs of their immediate situation and the match between those same traits and behaviors and the implicit leadership theories of their peers and others in their team (Epitropaki & Martin, 2004). Implicit leadership theories (ILTs) are schemas or cognitive structures that specify the traits and behaviors an individual expects from a leader: What a leader

looks and acts like. These ILTs drive the emergence of leaders by the categorization of other people's (and the individual who holds the ILT) behavior and social prototypes like leader or follower (Scott, Jiang, Wildman, & Griffith, 2017). While little longitudinal research has been conducted, what research exists on the stability of ILTs over time has found that ILTs endure and are resistant to change once they've been established (Epitropaki & Martin, 2004).

The effectiveness of teams is enabled by many factors, but team leadership is perhaps the most critical for supporting the effective functioning of teams (Mathieu et al., 2008). It is only in the last decade that researchers have begun to study team leadership and how it is enacted and impacts the team and individual members within that team (Zaccaro, Rittman, & Marks, 2001). Zaccaro and colleagues suggest that there are three major factors impacting a team's performance: (1) Successful behavioral integration of team members (e.g., team processes), (2) the complexity and changeability of the environment the team is pursuing its goals within (e.g., contextual influences and constraints to performance) and how well a team adapts to those factors, and (3) team leaders. Historically, theories of leadership have treated leadership as a moderator which strengthens team processes of those around them when it is present (e.g., Fiedler, 1964; Kerr, Schriesheim, Murphy, & Stogdill, 1974). More recently, leadership processes have come to be seen as central drivers of a set of four team processes: cognitive, motivational, affective, and coordination processes (Zaccaro et al., 2001).

Although in the past research was focused on leader traits (e.g., characteristics skills, abilities, personalities), the current zeitgeist of leadership is mostly focused on leadership behaviors and their outcomes while acknowledging the role traits have in the emergence of leadership and the likely success of behavioral enactments (DeRue, Nahrgang, Wellman, & Humphrey, 2011). In a recent meta-analysis of the relative validity of the trait paradigm versus the behavioral paradigm, leadership behaviors explained more variance in leadership effectiveness criteria but the model was most effective when leadership traits and behaviors were integrated (explaining 31% of the variance in leadership effectiveness). Given the current focus on leadership behaviors, team leadership research overwhelmingly focuses on the behaviors and processes that team leaders engage in. However, major team leadership frameworks differ in their focus while trying to explain the impact of leadership on team processes and effectiveness. These frameworks include: (1) transformational leadership theories applied to teams, (2) leader-member exchange, (3) team coaching and development, and (4) leadership as functions.

Transformational leadership theory focuses on a leaders' impact on their followers (and team) through four types of behavior processes: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. (Dionne, Yammarino, Atwater, & Spangler, 2004). These processes (i.e., "the four I's of transformational leadership") revolve around inspiring, motivating, and articulating a clear vision for the group to strive towards. In doing so, they inspire

followers to transcend themselves and their perceptions of their own limitations to more effectively achieve the goals of the team (Bass, Avolio, Jung, & Berson, 2003). Transformational leadership has been found to be highly effective in teams (Mathieu et al., 2008) by inspiring improvements and alignment in terms of a team's teamwork processes which lead to improved team performance outcomes (Dionne et al., 2004).

The core of leader-member exchange (LMX) theories revolves around the fact that leaders do not treat all team members equally (Boies & Howell, 2006) and that by building social capital and social exchange quality between themselves and followers (Graen & Uhl-Bien, 1995) leaders can increase team outcomes. By building and leveraging high-quality, mature dyadic relationships to encourage team members and subordinates through support and encouragement leaders can increase team outcomes through improved teamwork process effectiveness and the emergence of positive emotional states (Boies & Howell, 2006). High LMX between a leader and followers also increases subordinates' effort and persistence (Maslyn & Uhl-Bien, 2001) as well as team and individual feelings of empowerment (Chen, Kirkman, Kanfer, & Allen, 2007).

Coaching and facilitating team learning and development are also seen as processes that enhance team teamwork (Yukl, Gordon, & Taber, 2002). Team coaching is defined as interactions with a team intended to help members make coordinated and task-appropriate use of their collective resources to accomplish teamwork (Hackman &Wageman, 2005). These behaviors are about helping team

members and subordinates learn, set effective goals, and otherwise train them to develop skills and confidence that will enhance both taskwork and teamwork. This is done primarily through assisting individual team members and the team as a whole in identifying their next developmental steps and goals the team holds to increase their collective performance (Clutterbuck, 2010). Unfortunately, in the coaching literature, specific models of team coaching are rarely validated or measured. However, a meta-analysis found that team training and team building interventions (which team coaching uses to develop their teams) have generally been found to be effective methods that team leaders can use to enhance teamwork performance, processes, and outcomes (Salas et al., 2008).

The last major framework of team leadership is functional leadership, which focuses on team leadership as satisfying the needs for team performance (Morgeson, DeRue, & Karam, 2009). The functional leadership perspective suggests that a leader "gets done what the team needs done" (Morgeson et al., 2009, pp. 4). The functional approach to leadership is more behaviorally focused and inclusive than many of the other leadership frameworks. For instance, Morgeson and colleagues (2009) list the specific behaviorally processes that leaders use to fill needs, including: defining the mission, solving problems, supporting the social climate, etc. This behavioral focus is not unique to the functional perspective, but what is unique is the suggestion that leadership behaviors are not solely invested in a single leader. Rather, the functional approach explicitly endorses the possibility that team members are capable of performing

leadership functions and thereby drive team processes more effectively when responsibility for those functions are shared (Drescher, Korsgaard, Welpe, Picot, & Wilgand, 2014). A final theme of the functional approach is the acknowledgement of leadership as multidimensional, in that leaders may focus on one, several, or all of the functions. In a group with more than one leader (either formal or emergent), these leaders might very well focus on different leadership functions and still equally co-lead, in differing ways.

Shared leadership. The concept of shared leadership has been defined as a multi-sourced, emergent process of mutual influence and leadership behavior enactment (Small & Rentsch, 2010). Shared leadership is a more recently studied, yet critical, component to improving teamwork and team outcomes (Kozlowski, Watola, Nowakowski, Kim, & Botero, 2009). The study of leadership has been the focus of hundreds of years of effort, but it is only recently as organizations have begun to explicitly shift the responsibility of leading teams away from an external leader and onto the teams themselves (Pearce & Sims, 2002). In fact, shared leadership as a research topic was born from the self-managed, empowered work team (Manz & Sims, 1987). Unlike traditional leadership wherein a single leader enacts directive, transactive, transformative, and/or empowering leadership behaviors, shared leadership relies on multiple individuals to enact those behaviors horizontally (Pearce & Sims, 2002).

Shared leadership is defined as an emergent process where members of groups and teams mutually influence one another, sharing leadership functions

between two or more people (Scott, 2014; Small & Rentsch, 2010), that allows groups to achieve group and organizational goals (Pearce, Manz, & Sims, 2008). The shared leadership perspective unites the behavioral leadership approach most team leadership frameworks are based on with the relational approach of the LMX literature. It emphasizes social interactions between team members and involves lateral influence actions, goal-setting, motivation, and other leadership actions rather than top-down leadership enactment (Contractor, DeChurch, Carson, Carter, & Keegan, 2012; Hiller, Day, & Vance, 2006; Pearce & Conger, 2003). It is important to note that shared leadership is not necessarily incompatible with vertical (traditional) leadership. Rather, shared leadership can exist as a supplement to traditional leadership instead of a replacement (Wang, Waldman, & Zhang, 2014). Shared leadership's impact on teams is dramatic, with multiple meta-analytic studies showing a strong relationship to team outcomes, behavioral processes, and attitudinal states (D'Innocenzo, Mathieu, Kukenberger, 2016; Nicolaides et al., 2014; Wang et al., 2014). Research has also found that cognitive emergent states are enhanced by shared leadership with teams characterized by high levels of shared leadership having significantly more accurate and shared team mental models (McIntyre & Foti, 2013).

Team Internal Environment. Emergent states are higher-level properties of a group that emerge from the complex interactions of lower-level elements, and that summarize the group's characteristics, attitudes, values, perceptions, and cognitions (Kozlowski & Klein, 2000). A team's internal environment (e.g., team

climate) is an emergent state that acts as a context within which team members perform teamwork processes. Emergent states are often implicit within the situation and invisible to the members of the group or team (Glisson & James, 2002), meaning a team's internal environment can have powerful and subtle effects on the ways teams perform their teamwork and taskwork processes. In essence, a team's internal environment can subtly dissuade and/or encourage specific types of teamwork processes such as communication and information sharing (Salas, Sims, Burke, 2005), team outcomes such as team viability (e.g., the desire of the team to work together over long periods of time), the quality of team member relationships, as well as the actual level of success of taskwork and team projects.

A team's internal environment is composed of many separate factors. Carson and colleagues (2007) define three factors of a team's internal environment as feelings of shared purpose, social support, and voice. Shared purpose is defined by Carson as an emergent state where team members feel they have similar understandings of their team's primary objectives (Carson et al., 2007). Social support is the second factor identified by Carson and colleagues. They define this emergent state as perceptions that team members' "make efforts to provide emotional and psychological strength to one another" (Carson et al., 2007, p. 1222).

By encouraging individuals and recognizing both individual and team accomplishments, teams characterized by high levels of social support are likely to have strong cohesion and viability, allowing the team to build strong interpersonal relations. The last component of team internal environment discussed by Carson

and colleagues (2007) is voice. While there is no standard definition of voice, in the study of shared leadership, voice has been defined as "the degree to which a team's members have input into how the team carries out its purpose" (p. 1222). In essence, voice is based on the perception within the team that there is an opportunity to voice opinions and add to discussion and debate around team goals, procedures, and alternative approaches.

Voice, social support, and shared purpose are important factors to consider because they act as enablers of joint team action. When people feel they have voice in team decisions, they are more likely to add theirs to the chorus. Social support helps to support team members, so they are less likely to feel overwhelmed or worried when engaging in collaborative or leadership tasks. Shared purpose enhances their engagement with the team's goals and tasks, increasing participation. These three components of team internal environment are important and have an impact on the effectiveness of teams and even other team processes and emergent states (Carson et al., 2007; Russo, 2012). However, other important components of a team's internal environment are relevant to the aims of this study and provide a more complete understanding of the team's internal environment. These components include team potency and team psychological safety.

Team potency is a subset of a group of efficacy-related perceptions and beliefs (e.g., team capability) beliefs referring to a team's emergent beliefs in their own capacity to be effective as a team (Collins & Parker, 2010). Team potency is the global belief in the team's effectiveness, irrespective of the task or goal they

currently have (Collins & Parker, 2010). Feelings of team potency enhances a team's feeling of self-control and power over their own ability to complete their tasks. Teams with higher team potency are more likely to engage in goal setting, show persistence when facing challenges, and adopt more flexible strategies to completing their tasks, and generally become more engaged and deliver more effort (Bandura, 1997; Gully, Incalcaterra, Joshi, & Beaubien, 2002). Team potency has also been found to be a strong predictor of team performance in meta-analytic research (Collins & Parker, 2010) and has been found to be relate to team citizenship behaviors (TCBs; Pearce & Herbik, 2004). TCBs are discretionary, positive behaviors that can help the functioning of the team in reaching its goals and go above and beyond the minimum required for the individual to successfully complete their own role. These perceptions of team potency (and other team capability beliefs) begin to emerge at the very moment a team starts working together (Collins & Parker, 2010). The initial interactions among new team members provide lasting information to all team members about how their team dynamics will function (Gersick, 1988) and this information as perceived by team members will constrain or enable team performance.

Psychological safety is an emergent state associated with feelings of being able to be themselves or take on challenges without fear of negative consequences or threats to self-image, status, or career (Kahn, 1990). Kahn suggests that when individuals feel psychologically safe and secure they have an increased willingness to engage (e.g., become involved or expressive physically, cognitively, and/or

emotionally) rather than a desire to disengage (e.g., withdrawal and self-protective behaviors). At the team-level, as a component of a team's internal environment team, psychological safety is defined as a shared belief that the team is a safe place to take interpersonal risks (Edmondson, 1999a). Gibson and Gibbs (2006) further discuss team psychological safety in terms of a communication climate wherein team members feel the internal team environment which encourages and accepts open, supportive communication and speaking up. Those interpersonal risks may be as small as speaking up in a meeting with a new idea or perspective, or as consequential as speaking out when noticing the team is making a mistake (e.g., a co-pilot of an airliner speaking up when they notice the captain making an unusual choice or forgetting to do part of a checklist). Within groups, research has shown that team members tend to harbor similar perceptions of psychological safety because they are subject to the same contextual influences and salient shared experiences (Edmondson & Roloff, 2009).

Team Socialization Processes. Team processes are those built upon the behaviors necessary for helping team members accomplish their taskwork (e.g., individual level performance processes; Morgan, Salas, & Glickman, 1993). While it is taskwork (e.g., activities that individuals or teams engage in which are essential to their organizational role and the completion of individual and joint tasks; Wildman et al., 2012) that is often a key focus (and requirement) for teams looking to complete goals, teamwork behaviors essentially support and aid the effectiveness of taskwork processes (Salas, Shuffler, Thayer, Bedwell, & Lazzara,

2014). Marks and colleagues (2001) suggest teams engage in three general categories of team processes: transition processes, action processes, and interpersonal processes. These three types of processes are engaged in at different periods of a team's performance cycle. Transition processes are those generally enacted when teams are evaluating or planning their teamwork/taskwork and previous (or future) goals and performance. Action processes are generally enacted during periods of time when the team is engaged in activities that directly transform team inputs into team performance and outcomes (e.g., communicating and coordinating taskwork between team members, helping others in need). Finally, interpersonal processes occur throughout the entire performance cycle and this category of processes represents behaviors and processes used to manage their interpersonal relationships with other team members.

As teams initially form and develop, they undergo socialization processes to develop shared systems of knowledge in the form of norms, role expectations, and other informal structures (Kozlowski & Bell, 2013) that support future team performance and growth. Team socialization is a process in which team members engage in mutual influence with each other when new teams are forming or with new members when new individuals enter existing teams to facilitate the creation or assimilation of these shared systems and processes (Anderson & Thomas, 1996). We know that socialization processes are essential to building quality relationships among team members and play roles in reducing ambiguity, conflict, improved team orientation team affect (Kozlowski & Bell, 2013). Unfortunately, little

research has gone into understanding the actual behaviors and tactics teams and team members use during the socialization process (Kozlowski & Bell, 2013) with the majority of research examining organizational socialization and the formal socialization processes organizations and leaders use. What is clear, however, is that team socialization is a period of time where teams and team members are most malleable, and that socialization sets the stage for all other team processes and emergent states. Even the research that focuses on formalized organizational socialization finds that the effect of formal socialization efforts is dominated by the intense socialization processes occurring within teams (Anderson & Thomas, 1996). As such, understanding the interpersonal processes teams use during the socialization process is critical to ensuring the foundation of both team and organizational effectiveness is laid early.

One key state that emerges in the socialization process is the development of rapport and high-quality relationships between team members (Pullin, 2010). Rapport can be defined as a meaningful interpersonal experience that is characterized by a feeling of "harmonious connection" (Tickle-Degnen, 2006) with the people around us. Rapport as an emergent state is behaviorally defined by attentiveness and responsiveness to the intentions, emotions, and attitudes of others who share a state of rapport. While rapport can often emerge naturally in groups composed of people with similar appearances, interests, or backgrounds, behavioral processes that promote feelings of rapport have been identified. Research shows that positive interpersonal processes (e.g., affect management, conflict

management, and motivating/confidence building) are likely to build a feeling of rapport within a team (Wildman & Griffith, 2015). Specific behaviors include: being considerate and showing respect for the welfare, feelings, and viewpoints of others, building a sense of positive affect and liking among members through calming others, boosting their spirits (e.g., making jokes), and reducing feelings of fear or anxiety (e.g., through self-disclosure, making people feel comfortable). Nonverbal cues also help to build rapport including entrainment behaviors such as immediacy (e.g., an immediate response highly coordinated with the other person) and mimicry (e.g., conscious or unconscious mirroring of behaviors, and words used by others) build feelings of affiliation and trust important to long-term rapport (Tickle-Degnen, 2006). The mere act of sharing or expressing revealing aspects that could leave a person potentially vulnerable to others has been found to build feelings of trust, affiliation, and rapport (Butler et al., 2003). Additionally, even the simple act of small talk has been found to build relationships and trust in international teams (Pullin, 2010).

Yet again, despite the importance of behavioral interactions for fostering team success and performance, there is surprisingly little research into social interaction behaviors within the intrateam domain (Bonaccio, O'Reilly, O'Sullivan, & Chiocchio, 2016) and a dearth of research examining the socialization interaction process within teams (Kozlowski & Bell, 2013). Accordingly, there is much still be learned about the team socialization process and the behaviors that build rapport and make it successful.

Team Composition

Where team processes and emergent states drive critical behavioral, attitudinal, and performance outcomes that define the success or failure of teams, team composition drives the type, quality, and ease with which these team processes and states emerge and function. Team composition is based on the configuration, combination, and disparity of diverse team member traits and characteristics. In the section below, I outline how team composition drives the effectiveness of team processes and the emergence of team states.

Compositional Factors. Prior research has found many individual differences or factors that relate to team effectiveness and performance (Bell, 2017). However, of interest to the current research are individual differences or traits that predict a person's engagement or interest in working collaboratively with others. Personality traits such as agreeableness (e.g., how considerate, trusting, friendly, and focused on social harmony someone is, Bell, 2007), propensity for trust (e.g., an individual's general willingness to trust others; Jarvenpaa, Shaw, & Staples, 2004), extraversion (e.g., how energetic and socially oriented an individual is; Bell, 2007) have all been found to relate to team effectiveness and collaboration (Bell, 2007; Bell, 2017). One particular factor that has a broad impact on a team's processes and emergent states is a team's composition in terms of members' collective or team orientation.

Team orientation can be defined as a person's orientation towards or propensity for working in a collaborative manner in team settings (Driskell, Salas,

& Hughes, 2010). Team orientation is composed of two factors: affiliation and cooperativeness. Affiliation (as defined within collective orientation) represents the value an individual holds towards working with others versus working alone and cooperativeness (discussed as dominance in Driskell and Salas' development of the construct) represents the value an individual places in cooperating with others compared to dominating and controlling the group. To illustrate, a team member who has a high collective orientation is one who works well with others, seeks the input of others, and enjoys belonging to and working in teams.

Previous research has found that a team's mean level of team orientation reduces the amount of dysfunctional, relational conflict that emerges within diverse teams (Mohammed & Angell, 2004). Other researchers have examined the impact of collective orientation under the label of psychological collectivism (orientation towards collective work) where higher levels of the construct have been found to support the emergence of shared leadership behaviors in groups (Chen, 2014; Hiller, Day, Vance; 2006; Small & Rentsch, 2010). A very similar construct is also found in the values continuum of individualism-collectivism which is a person's held value which can be defined as "the relative importance people accord personal interests to shared interests." (Wagner, 1995: pp. 153). On the one side of the continuum, individualists accord their own interests and needs as higher than the needs of the groups (or teams) they belong to. Collectivists, on the other hand view group interests and needs as holding more value than their own interests, which they are willing to sacrifice for the collective (Gundlach et al., 2006). Research has

found that people with highly individualistic values are resistant to teamwork (Kiffin-Petersen & Cordery, 2003; Kirkman & Shapiro, 2001), and are less cooperative in team settings (Wagner, 1995). Individuals holding collectivistic orientations, however, perform better when given collective responsibilities. This orientation towards team goals and team membership has important facilitative properties with researchers finding that collectivistically oriented individuals are more prone to working to identify with their team and then incorporating their team's identity and goals as their own (Gundlach et al., 2006). This identification process and state of holding team identity has been found to facilitate team performance and individualistically oriented individuals are far less likely to engage in identification processes or identify with their teams (Gundlach et al., 2006).

Another important compositional attribute for understanding team dynamics is power distance, or preference for hierarchy. While power distance is the more common naming convention, there is little difference between the two concepts beyond power distance typically being the label associated with cultural differences in preferences and values while preference for hierarchy tends to describe more individual-level preferences. Regardless of the label used, preference for hierarchy relates to the extent to which an individual accepts unequal distributions of power in society and in groups (Hofstede, 2010). Individuals high in power distance readily accept and prefer that hierarchy and diverging social status in collectives, regardless of their status within that hierarchy (Adler, 1991). For instance,

individuals high in power distance also feel inferior to their superiors (Clugston, Howell, & Dorfman, 2000) and are more likely to desire that the teams and groups they are working in have very clear, unambiguous leadership hierarchies (Scott, Jiang, Wildman, & Griffith, 2017).

Team configurations. When individuals are aggregated into groups, these members' knowledge, skills, abilities, and other characteristics (KSAOs) are combined to create a higher-level (e.g., team-level) variable composed of these characteristics. This team configuration has been found to clearly impact team processes, emergent states, and outcomes (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014; Stahl, Maznevski, Voigt, & Jonsen, 2009). Aspects of team configuration include the mixture of personalities of team members (e.g., differing personality types, levels of extroversion, conscientiousness, social orientation, etc.; Peeters, Tuijil, Rutte, & Reyman, 2006), demographic diversity (e.g., race, gender, age), cultural diversity (Stahl et al., 2009), linguistic diversity (Henderson, 2005), and differences in levels of ability (e.g., cognitive differences, political skill, etc.; Devine & Philips, 2001) as well as functional background (e.g., educational background, functional specialization, and past work history; Bell, Villado, Lukasik, Belau, & Briggs, 2011).

While a great deal of work has been done to attempt to predict the impact of differing team compositions or profiles (e.g., faultlines, personnel teamwork considerations, surface- or deep-level diversity; Mathieu et al., 2013) the result has been often inconsistent with some studies reporting different team compositional

profiles as being beneficial, detrimental, or having no impact. What we've come to understand over the course of this research is that team composition is not static but rather dynamic (Gully, 2000). Team composition is the starting point, the first piece of the puzzle, but to fully understand its impact we must understand how team dynamics develop and change (Marks, Mathieur, & Zaccaro, 2001; McGrath & Tschan, 2007).

At its most fundamental, team composition is based on the pattern of held attributes across team members within the team. These patterns, including homogeneity in attributes, drive the emergence of the dynamics that shape team outcomes. There are two general models of team configuration relevant to the emergence of these team dynamics: compositional and compilational emergence (Kozlowski & Klein, 2000). Compositional emergence is based upon the assumption of isomorphism in the team. The phenomena in question is essentially the same at both the individual team-member level of analysis and when converged into a property of the team itself. For example, a team composed of highly extroverted individuals in a compositional model could be assumed to be characterized by high levels of team-level extroversion: the team itself is highly extroverted. However, compilational models do not assume isomorphism but are based on assumptions of discontinuity. Rather, compilational processes create a higher-level team property through the interactions of multiple lower-level individual characteristics and properties.

Team Diversity and Homogeneity. Teams in the United States and the rest of the world are becoming increasingly diverse in terms of the configuration of team member attributes (e.g., demographics and psychological differences; Bell & Outland, 2017). Creating teams based on diversity in terms of backgrounds, abilities, and other characteristics theoretically should provide a competitive advantage by creating new, holistic team compilations wherein the whole is more effective than the sum of its individual parts. However, research has consistently found that diversity in terms of team configuration can often lead to lowered outcomes and dysfunctional team dynamics (Mathieu, Maynard, Rapp, & Gilson, 2008; Sherry & Patel, 2011; Stahl et al., 2009). While for decades, no consistent meta-analytic main effects had been found for the diversity-performance relationship, more recent meta-analyses have found that unless managed successfully by the team itself or by outside (or internal) leaders, diverse teams can become mired in process loss and conflict (Stahl et al., 2009).

Two complementary perspectives exist regarding the impact of diversity on performance and team success (Kearney & Gebert, 2009): the informational/ decision-making perspective (which predicts process gain through diverse informational resources and viewpoints) and the social categorization perspective (which predicts process loss and conflict due to reduced team cohesion and inclusion). Coupled with these two perspectives are two general categories of diversity characteristics: surface- and deep-level diversity. Each has a unique impact on team performance over the course of the lifespan of a team with surface-

level characteristics being more salient early in the lifespan of the team and deep-level diversity becoming more salient as team members spend more time working together (Harrison, Price, Gavin, & Florey, 2002).

Defined as overt demographic characteristics (e.g., age, race, gender, wealth, etc.), surface-level characteristics are often referred to as "demographic diversity characteristics" and are immediately visible to individuals during interactions (Harrison et al., 2002). These characteristics are almost immediately used to classify and categorize the social environment by all social actors (see Social Identity Theory, below) and can have immediate, early impact on teams (Harrison et al., 2002). Stahl and colleagues (2009) found that these immediate effects of surface-level diversity have a significant, negative impact on a team's communication effectiveness and that communication in diverse teams becomes less effective as the team grows larger.

An often used (some might say cliché) metaphor for diversity is the iceberg. Only the smallest portion of diversity is visible (e.g., surface-level diversity) and the bulk of the iceberg remains hidden beneath the water. Deep-level diversity is a category of diversity based around intra-group differences in ability, personality, attitudes, and values (Mohammed & Angell, 2004). These include cultural values, attitudes, personality differences, differences in social ability, intelligence, the value people place on different aspects of society or their environment, experience in the relevant contexts, and more (Bell, 2007). In truth, deep-level diversity includes more aspects than can be comfortably listed in this paper. Suffice to say,

deep-level diversity it has an enormous impact on the way individuals work together and shapes team dynamics in ways that we are largely ignorant of (Bell, 2007; Stahl et al., 2009).

National Diversity. Straddling the divide between surface- and deep-level diversity, nationality contains components of each (Buengeler, & Den Hartog, 2015) such as communication style, physical features, and language (e.g., surface-level characteristics) as well as beliefs and values (e.g., deep-level characteristics). Being both immediately obvious in many cases as well as often representing more meaningful deep-level differences between individuals, nationality is often used by individuals to categorize others in a team. This ease in categorization allows for national diversity to be both an asset (e.g., unique informational resources and viewpoints; Kearney & Gebert, 2009) and a weakness by undermining feelings of inclusion, and resulting in the creation of faultlines and subgroups (Nishii & Mayer, 2009; Shemla et al., 2016).

Social Identity of Groups. While much research focuses on the effects of actual (objective) diversity in teams, there has been relatively little research conducted regarding members' awareness of differences (e.g., perceptions of diversity). Yet what research exists suggests that perceptions of diversity might be more important than actual demographic differences (Homan & Greer, 2013; Homan, Greer, Jehn, & Koning, 2010). Diversity perceptions can be defined as perceptions of dissimilarity and similarity among team members in terms of readily detectible attributes (Shrivastava & Gregory, 2009) as well as deeper-level

attitudes, values, and beliefs (Turban, Dougherty, & Lee, 2002). While diversity indices seek to measure actual diversity, measures of diversity perceptions do not so much measure actual diversity so much as the degree of perceived difference existing within the team (Shemla et al., 2016). However, there is a clear conceptual and value difference between viewing the team as diverse versus feeling different from the team.

Shemla and colleagues (2016) identify three general classifications of perceived diversity: self-to-team (e.g., dissimilar from teammates), subgroup splits (e.g., subgroups and faultlines are present), and whole team diversity (e.g., group heterogeneity). Individuals who perceive themselves as dissimilar to the rest of their team or to other subgroups within the team are more likely to categorize those individuals and subgroups as part of their out-group and thus this kind of perceived diversity is more likely to produce negative team and individual outcomes (Shemla et al., 2016) including reduced levels of cohesion and identification. Conversely, perceiving a team as being more generally heterogeneous is more likely to produce beneficial diversity effects because of the individuation of other team members and the identification of the individual with that diverse group. The effects and results of perceived diversity are related to several underlying factors, including personality (with lower levels of agreeableness and extroversion leading to higher self-to-team dissimilarity) and pro-diversity beliefs (leading to a reduced perception of subgroups; Shelma et al., 2016). Further, the actual behaviors of leaders and team members have been found to reduce the negative impacts of diversity on team

climate and process measures including transformational and supportive leadership behaviors (e.g., Homan & Greer, 2013; Kearney & Gebert, 2009).

Social Identity Theory was born as a theory of intergroup relations, conflict, and cooperation (Tajfel, Turner, Austin, & Worchel, 1979) but it has become a broader theory on the role of self and identity in group and intergroup dynamics (Hogg, 2016). By a great extent, it's become clear that social dynamics are largely driven by the traits, behaviors, and characteristics of social actors. The implicit identification of those behaviors and characteristics by others then lead to similarity-attraction principles where individuals feel socially attracted and connected to groups composed of people that they feel are like themselves. Tajfel and Turner (1979) define this social identification and identity as knowledge that an individual belongs to certain social groups together with some emotional and value significance to that belonging.

Social identity and social identification then are based on the perception of belonging to some aggregation of humanity: someone from the United States, for example, may very well identify strongly with that national identity and those who share it. This shared group identity becomes integral to self-concept and self-esteem. Thus, when an individual identifies strongly with a group they begin to feel as though their own fate and self-esteem is intertwined with the fate and esteem held by the group. Groupings that have been examined at length include political parties, sports teams, nation-states, religions, cultures, even race/ethnicity (Ashforth & Mael, 1989; Tajfel & Turner, 1985). However, team identification (most

commonly observed as an outcome variable) and identification with organizations follow a similar principle.

This feeling of shared destiny causes individuals to experience the group's successes and failures as personal; as affecting their own personal outcomes and identities. Individuals who identify strongly with a group are likely to remain committed and loyal to that group despite loss or lack of benefits. In some sense, this explains why organized sports can have such vibrant and aggressively committed fan bases. Through social comparison, the individual evaluates group membership to compare their own place and their group's place within society. This social comparison allows individuals to determine the social status, value, and benefits their group possesses when compared to other groups (Tajfel & Turner, 1985). When individuals have internalized their membership with a group and incorporated self-esteem and the perceived value of group membership, group members will often discriminate against other groups (Abrams & Hogg, 1988) to maintain or further their self-esteem and their group's position. This identification with the group, leads to an answer for a question of "who am I?" because this question can be answered, at least partly, "I am a part of this group."

This perception of "oneness" with a group is used then to define that individual and becomes part of their identity. In teams, as individuals begin to identify with their team members they perceive this group membership as integral to their own sense of self they begin to develop cognitive, behavioral, and emotional alignment with team members whom they identify with (Gundlach,

Zivnuska, & Stoner, 2006). Implicit in the creation and perception of these social identities then is an increasingly salient perspective of how one's group (e.g., the in-group) is distinct from relevant out-groups or individuals within whatever social context individuals are operating within (Hogg, 2016). Social identity principles can also be applied to leader emergence, wherein the most prototypical member of a group is seen by both the in-group and the out-group as the leader and representation of that group (Hogg, 2001).

Development of Hypotheses

This study tests a proposed model in which the emergence of shared leadership is influenced by team surface-level diversity, team orientation, and team socialization behaviors, which all impact the team's internal environment, which has already been established as a central predictor of the emergence of shared leadership (i.e., Carson et al., 2007). In addition, I propose that the team's preferences for hierarchy will moderate the relationship between team internal environment and shared leadership emergence. Team orientation, team socialization behaviors, and team diversity are all factors that influence team internal environment through different mechanisms. Team socialization behaviors enhance perceptions of relationship quality between team members, and team orientation and team surface-level diversity are likely to directly impact the enactment of these behaviors. First, team orientation is a trait that acts as an intrinsic motivator to connect and enact shared, pro-team behaviors (e.g., socialization). Team surface-level diversity impacts the initial perception of the team as being already possessing intrinsic qualities that lower the barriers to socialization. Therefore, both team orientation and team surface-level diversity are likely to directly impact the enactment of these behaviors.

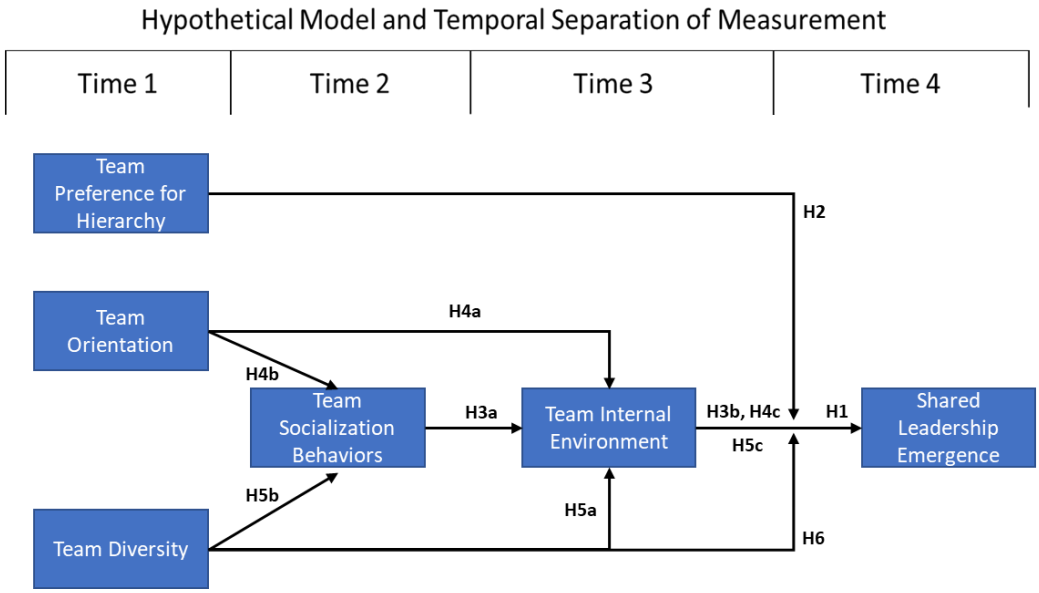

Figure 2 – Hypothetical Model

Much is known about the beneficial impact shared leadership has on a team's performance (D'Innocenzo et al., 2016; Nicolaides et al., 2014; Wang et al., 2014) but little has been studied regarding what factors are likely to impact the emergence of shared leadership in teams. Carson and colleagues (2007) have previously found a relationship between team internal environment and shared leadership. However, team internal environment is composed of a multitude of emergent affective and cognitive states which act as a context supporting or hampering the interactions, relationships, and task performance of team members. All of these emergent states have been found to strongly relate to team outcomes and processes (Carson et al., 2007; Mathieu et al., 2008).

What this suggests, then, is that a positive team internal environment characterized by perceptions of voice, shared purpose, social support, psychological

safety, and feelings of team potency will result in more individuals willing to participate in leadership behaviors. A positive team internal environment facilitates the development of shared leadership because it lowers the "barriers of entry" for attempting leadership behaviors. Taking (or attempting to take) on responsibility for leading others is inherently an interpersonal risk. To do so, an individual must either have a very strong trait orientation towards leadership that overrides situational constraints (Judge et al., 2009) or must feel comfortable and confident in engaging in interpersonal risk-taking behaviors characteristic of leadership like speaking out and influencing others (Edmondson et al., 1999a).

This is backed up by the small amount of literature that exists on the subject. Small and Rentsch (2010) found that intra-team trust fostered shared leadership emergence. Carson and colleagues (2007) found similar relations with three aspects of a team internal environment and shared leadership: voice, shared purpose, and social support. Perceptions of a team's internal environment are likely to directly impact the emergence and pattern of leadership behaviors by affecting the willingness of team members to participate in actively leading the team. This study seeks to broaden research on team internal environment and shared leadership emergence by suggesting that factors not previously considered as part of team internal environment do in fact compose a team's internal environment: psychological safety and team potency. Whereas voice climate is already considered part of a team's internal environment and represents perceptions of a person's ability to be a fully included participant in the team (Brockner et al.,

2001), team potency describe a person's belief in the team's ability to perform and work together effectively (Collins & Parker, 2010) while psychological safety focuses on a person's feelings of anxiety with regard to taking interpersonal risks like participating in the leadership of a team (Edmonson, 1999a). In combination, these factors can more holistically describe the socio-emotional tenor of the team (e.g., voice climate, psychological safety) and the behavioral expectancies of participation (e.g., team potency) that need to be in place to justify putting in the extra effort and accepting the risk that enacting leadership behaviors requires. Therefore:

Hypothesis 1: Team internal environment, including voice climate and proposed new additions team potency and psychological safety, is positively related to shared leadership.

Individuals with a high preference for hierarchy are unlikely to accept shared leadership structures and may actively resist a situation in which they have a high degree of shared leadership, regardless of whether they are leader or follower, because a shared leadership structure is incompatible with their preferred (e.g., hierarchical) leadership structure (Scott et al., 2017). Therefore, in teams characterized by high preference for hierarchy, it is likely that shared leadership will not emerge, regardless of perceptions of the internal team environment. In fact, Scott et al. (2016) found direct support for the relationship between preference for hierarchy and shared leadership in a small sample of teams. Teams with a higher preference for hierarchy were less likely to share leadership (B = -2.25, R^2 = .40).

Currently the majority of research into individual (or team) preference for hierarchy has focused on cultural or national-level differences between groups (Hofstede, 2010). However, preference for hierarchy is not just a cultural value. Implicit leadership theories reflect the content of what a leader looks like and how they act but they also reflect expectations and assumptions regarding the way leadership should be structured in collectives (Scott et al., 2017). While there are mean-level cultural differences between cultures and nations in terms of average preferences for hierarchy, there is generally more variance within cultures and nations than there is between them (Fischer & Schwartz, 2011). Accordingly, because variance in preferences and expectations regarding the distribution of leadership exist within all populations, these preferences are likely to broadly impact the formation of shared leadership in teams. Even when a team is characterized by a positive team internal environment, if its membership (or even just a few members) prefers hierarchical leadership to shared leadership, then shared leadership is less likely to emerge.

This is because an individual with a high preference for hierarchy faced with the absence of a formally established leadership hierarchy will naturally assume a single person will take on command of the group because that fits their implicit expectations about the structure of leadership in collectives. This individual they expect to take on leadership is likely someone who has status, expertise, or otherwise fits their expectations on what a leader looks and acts like. Should they not attempt to take on leadership of the team themselves, they are

likely to look to another to make decisions and guide the team towards success. If a person with high preference for hierarchy feels they should lead, they are likely to resist the attempts of others to take on leadership responsibilities or share their "rightful" role. The resistance and discomfort of people who prefer hierarchy with a shared leadership system, inherently undermines the emergence of shared leadership as these individuals withdraw, ignore suggestions or attempts to share leadership, or continue to look to others for guidance. Therefore, I hypothesize that:

Hypothesis 2: Team preference for hierarchy moderates the positive relationship between internal team environment and shared leadership such that the relationship is weaker when team preference for hierarchy is high.

Joining a new, unfamiliar group and working with near-strangers can be an anxiety-inducing experience (Harrison et al., 2002). To manage this anxiety, teams often engage in interpersonal processes to build and manage new interpersonal relationships when first assembled or when new members are added to a collective. Through doing so, they strive towards developing mutual rapport and feelings of safety, trust, and belonging (Tickle-Degnan, 2006; Gibson & Gibbs, 2006). Research has shown that these early moments in a team's lifespan are the *most malleable* and, therefore, set the foundation for all of the team's future processes and emergent states (Kozlowski & Bell, 2013).

The literature suggests that the more team members socialize early in their team's lifespan, the more familiar they become with their teammates, and the more they begin to identify with the team and desire to align their efforts with the efforts

their teammates (Gundlach et al., 2006). The socialization process acts to help team members learn about each other, reducing feelings of ambiguity, and increasing the sense of interpersonal comfort and safety within the team through rapport and identification. By enacting socialization processes early in the lifespan of the team, team members are setting into motion other processes that enable team members to begin to identify with each other and develop familiarity with one another.

One possible outcome of these processes is an amalgamation of the group's identity into each team member's own self-identity (Gundlach et al., 2006). For example, as the initial team socialization period begins, team members engage in interpersonal processes such as affect management and confidence building (Marks et al., 2001; Kozlowski & Bell, 2013) which include efforts to reduce fear and anxiety in team members (e.g., making jokes, making others feel comfortable), and building feelings of trust and affiliation with others (Butler et al., 2003). By reducing ambiguity and anxiety, enhancing positive affect, and building team identification, socialization processes impact the team's internal environment. The level of success a team achieves during the socialization process, or even in enacting attempts to engage in these processes, the more the team will improve its internal team environment by creating shared contextual influences and salient experiences that can be mutually understood by all team members (Edmondson & Roloff, 2009).

Few researchers have examined the dimensions of socialization in the context of teams. To that end, I identified four dimensions of socialization behavior

that are likely to emerge in the current study given the nature of the team's special purpose tasks. These dimensions are based primarily upon interpersonal processes (e.g., Marks, Mathieu, & Zaccaro, 2001) and relevant team socialization and rapport building (e.g., Butler et al., 2003; Pullin, 2010) and include: (1) individual consideration, (2) morale boosting, (3) small talk, and (4) appreciating others. Individual consideration behaviors are focused on showing respect for others while engaging in mission-related communication (e.g., thanking someone after asking them to perform a task). Morale boosting is also a socialization behavior that has its roots in the team's task but these behaviors focused on protecting the team from feelings of frustration and interpersonal friction that might reduce identification and commitment to the team and re-emphasizes the benefits of working with each other (Kozlowski et al., 2009). Small talk is another behavior underpinning team socialization. Small talk is defined as off-task communication that isn't obligatory but builds solidarity and perceptions of sharedness and oneness within the team (Pullin, 2010). Small talk helps to create common, "nonconflictual" ground that teams can occupy and share together. The final behavioral category within team socialization behaviors are those behaviors enacted to appreciate others. This type of socialization behavior is non-obligatory and related to the team's tasks. Appreciating others for their contributions occurs during the interpersonal phase of a teamwork process after a previous action process has been completed (Marks, Mathieu, & Zaccaro, 2001). Appreciating others helps to show other team members that they are valued and enhance feelings of team capability. Each of these

socialization behaviors help team members build a shared identity and are tactics to manage the team's affect (e.g., Marks et al., 2001) in a way that enhances perceptions of the team's internal environment. Therefore, I believe that early enactment of team socialization will enhance the team's perceptions of their team internal environment. Further, based on the previously established relationship between team internal environment and shared leadership, it is expected that there will be an indirect positive effect of team socialization on shared leadership emergence that is transmitted through team internal environment. Therefore, I hypothesize:

Hypothesis 3a: Team socialization behaviors are positively related to team internal environment.

Hypothesis 3b: Team internal environment mediates the positive relationship between team socialization behaviors and shared leadership.

Socialization alone is not the only way to improve perceptions of a team's internal environment. The team's preference towards working collaboratively rather than as individuals (e.g., team orientation) is highly likely to directly impact the team's internal environment. An individual that holds team oriented values (e.g., characterized by team orientation) is a person who is more likely to engage in collaboratively contributing to the team and to value and enjoy being a team member (Driskell, Salas, & Hughes, 2010). Researchers have found that collectively-oriented individuals like those with high team orientation have a strong need for affiliation with others (Schaubroeck, Lam, & Cha, 2007) and are more

likely to behave cooperatively in groups or teams (Dierdorff, Bell, & Belohlav, 2011; Eby & Dobbins, 1997; Kirkman & Shapiro, 2001). Other research has found that when a team is characterized by a high team orientation, there is less conflict related to team diversity (Mohammed & Angell, 2004).

Not only is team orientation likely to promote team-oriented behaviors, but team orientation also likely has a direct impact on the team members' perceptions. Individuals with high team orientation are also characterized by a strong need for affiliation (Schaubroeck et al., 2007) and are more likely to find the experience of team membership to be a pleasurable one (Driskell et al., 2010). Individuals that are more team oriented also have an interdependent sense of self and a natural tendency to easily identify with others (Gundlach et al., 2006). Their orientation towards affiliation and cooperation and the ease with which these individuals begin to perceive their teammates as in-group members, then, is likely to directly enhance their perceptions of the team's internal environment. Further, because of this strong drive and need for socialization and collaboration, teams and individuals are predisposed to perceive the team environment in a positive way by seeking out and being drawn to cues that confirm their preferences (Nickerson, 1998) and downplaying cues that contradict their preconceived belief in the safety of the team.

Team orientation has been found to have a direct effect on the formation of a shared group identity (Day, Gronn, & Salas, 2004; Lord & Brown, 2004). As previously discussed, the emergence of sense of shared identity is critical to the future emergence of shared leadership behaviors because leadership is an

inherently, interpersonally risky behavior (Edmonson, 1999a), especially in a group without a clear leadership mandate. The relationship between team orientation and shared leadership is likely to be based on a sequential, indirect relationship with shared leadership through improvements to the team's internal environment.

Further, team socialization and the team's composition in regard to team orientation are likely to be inextricably connected. For instance, while individuals with high team orientation are oriented towards cooperating and working together in teams (Kirkman & Shapiro, 2001), they are also highly oriented towards identifying with their team members and team (Gundlach et al., 2006). This need to identify with others and seek should drive socialization and rapport building behaviors. While team orientation is an individual-level difference held by each individual team member, when these individuals work together their individual levels combine to form a team compositional attribute (Mathieu et al., 2014) wherein individual-level differences and similarities can be understood as team-level properties (or a team profile; Mathieu et al., 2014). In turn, because this property describes the level of collaborative and identification drive held by the typical "average" team member, it can be used to examine the impact of team orientation within the team itself. Therefore, in teams characterized by high-levels of team orientation, individuals within those teams are going to be attempting socialization behaviors more regularly and other team members are more likely to reciprocate those attempts, leading to greater engagement in socialization and identification processes more often and more determinedly. In short, high team

orientation should drive a need for and pursuit of affiliation which results in micro-level action-reaction cycles (Fulmer & Ostroff, 2016) of socialization behaviors to establish social connections within the team (Eby & Dobbins, 1997). Based on all of the above, I hypothesize:

Hypothesis 4a: Team orientation is positively related to team internal environment.

Hypothesis 4b: Team orientation is positively related to team socialization behaviors.

Hypothesis 4c: The positive relationship between team orientation and shared leadership is mediated sequentially by team socialization behaviors and team internal environment.

Team orientation is not the only key compositional factor relevant to the emergence of perceptions of a positive team environment. Team surface-level diversity has been found to have negative effects on team social integration (Harrison, Price, Gavin, & Florey, 2002), a critical component of an internal team environment. Both overt, demographic differences (i.e., surface-level diversity) and unseen personality, value, and cultural differences (i.e., deep-level diversity) negatively impact the integration of team members when they are perceived. These differences, when perceived, continue to negatively impact diverse teams longitudinally, even across months of interactions (Harrison et al., 2002). For example, a meta-analysis by Horwitz and Horwitz (2007) found that team diversity was negatively related to social integration and time bound. Early in a team's

lifespan, surface-level characteristics drive tensions and negative emergent states and processes due to a lack of social identification between team members from diverse backgrounds (Horwitz & Horwitz, 2007). As teams mature, deep-level differences begin to drive the negative effects on team outcomes and surface-level characteristics grow less important. The key mechanism behind the impact of diversity on teams is based on social identity theory (Tajfel & Turner, 1985), which suggests people automatically categorize themselves and others into in-groups and out-groups based on perceptions of similarity. Individuals are socially attracted to groups they perceive as being prototypically similar to themselves (Hogg, 2001). Based on this theoretical background, the more different a person feels in relation to his or her teammates the more difficulty they will have in adopting a positive, internalized team identity.

However, not all surface-level characteristics are likely to be equally salient. For instance, knowing an individuals' religious identity might not be immediately obvious unless cultural or religious symbology is easily noticeable or when race and religion are erroneously lumped together (e.g., individuals of Arab ethnic backgrounds). What will be most immediately identifiable in a new team are likely to be broad category differences, such as gender, race, and nationality. Gender and race are immediately apparent whereas nationality can often be identified shortly after (e.g., through noticing an accent, language usage, comfort in speaking in the primary language, clothing, etc.). In sum, people categorize themselves as similar or different from others. These perceived differences or similarities impact their

perceptions of others as “in-group/cooperation-safety” or “out-group/threat-competition” and individuals identify with groups of people more like themselves. In their study of 111 work teams across four organizations, Kirkman, Tesluk, and Rosen (2004) found that the more dissimilar a team leader was (in terms of race) from a team member the less that team member viewed the team as an empowering environment. Implicitly, these immediate perceptions color our behaviors towards others which can lead to lowered perceptions of a team’s internal environment and, through that link, reduced enactment of voluntary (and interpersonally risky) behaviors like shared leadership. Based on this, the relationship between surface-level diversity and shared leadership is likely to be transmitted indirectly through negative perceptions of the team’s internal environment.

Team surface-level diversity is also likely to affect the level of socialization that occurs naturally within the team. While little research has directly examined the impact of diversity on team socialization behaviors, research shows that diversity hampers the interpersonal processes of teams (Mohammed & Angell, 2004). Other research also shows that perceptions of dissimilarity reduce expectations that rapport can built and a willingness to engage with others (Feurtes, Potere, Ramirez, 2002). Even having a different accent from others can trigger evaluations of trustworthiness, interpersonal value, and perceptions of that others share your values (Feurtes, Gottdiener, Martin, Gilbert, & Giles, 2012). In their meta-analysis, Feurtes and colleagues (2012) found that the impact of accents on these perceptions was substantial (Cohen’s D = 0.82) suggesting that the more

dissimilar individuals are in terms of aspects of diversity, the greater the impact on socializing behaviors likely will be. Research also shows that in cross-functional teams, minority group members face increased social isolation and reduced relationship quality with their majority-group peers (Baugh & Graen, 1997). Further, these minority group members see engaging in relationship building behaviors as more difficult and laborious to engage in (Baugh & Graen, 1997). Social identity theory suggests that when people see themselves as more similar to others (e.g., groups or individuals) they are more attracted to those others and more actively engage in processes to lower the barriers between them (Hogg, 2016). Research shows evidence for the impact of similarity-attraction perceptions with members perceiving others who are dissimilar more negatively and with less empathy (Williams, Parker, & Turner, 2007). These negative interpersonal valuations and perceived increase in emotional labor are likely to reduce the incidence of socialization behavior within the team. There is some evidence to support this hypothesis within an organizational setting: new employees who perceive themselves as different from their colleagues are less proactive in establishing close relationships with them (Liao, Chuang, & Joshi, 2008). All of these factors are all likely to impact the incidence of proactive and voluntary socialization behaviors. Based on all of the above, I hypothesize that:

Hypothesis 5a: Surface-level diversity is negatively related to team internal environment.

Hypothesis 5b: Surface-level diversity is negatively related to team socialization behaviors.

Hypothesis 5c: The negative relationship between team surface-level diversity and shared leadership is mediated sequentially by team socialization behaviors and team internal environment.

Finally, patterns of surface-level, demographic composition can have a critical role in influencing team perceptions. One form of these demographic patterns is known as faultlines (Thatcher & Patel, 2011) which are defined as hypothetical dividing lines splitting a team into homogeneous subgroups based on a team member's demographic alignment with others. For instance, a team of four men and two women would have a clear faultline on the basis of sex. However, these faultlines can be created, and can even overlap, based on the intersection of multiple demographic factors (e.g., age, race, nationality, education; Thatcher & Patel, 2011). The results of their study found that teams comprised of multiple demographically homogenous subgroups faced strongly reduced performance, reduced team cohesion, and increased relationship and intra-team conflict. This can make it more difficult for a social minority (e.g.,, minority status individuals with different ethnic, age, gender, or sexual orientation backgrounds compared to the group majority) to assume leadership roles and enact leadership behaviors. For example, in their study on African Americans, Purdie-Vaughns and colleagues (2008) find conclusions that seem easily transferrable to broader social identity dynamics. In their study, African Americans who don't fit with the larger group

membership (due to minority status and lack of clearly broadcast signals valuing diversity) often feel at risk and are more likely to feel anxiety and threat compared to those who do feel that they belong to the majority group (Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008).

While the effects are likely to be larger in stigmatized groups like African Americans, the basic principles could easily apply to the slightly effeminate Star Trek nerd working alone in a team of highly aggressive sports fans, or the woman working in a highly male-dominated organizational culture. Individuals who perceive themselves as not sharing a joint identity or who perceive themselves as different from their teams thus perceive this team environment with a degree of threat and/or discomfort and are unlikely to perceive it as a place where they have social support, shared purpose, and are less likely to feel it is a safe place. As previously discussed, these categorization and identification perceptions are dyadic between the team members to each other and directed at the team as a whole. Individuals might see another team member as not "fitting" the group just as that team member may not feel they fit in. Further, teams may identify with the team as a whole but not specific individuals within that team based on salient cues and subsequent interpersonal dynamics that emerge.

Therefore, it is likely that a member of a smaller, minority subgroup based on social category faultlines (e.g., faultlines related to demographics; Bezrukova, Jehn, Zanutto, & Thatcher, 2009) feels increased potentiality of interpersonal risk, increased isolation, and anxiety with regards to their seemingly outsider

membership in an otherwise homogeneous teams. Overall, these social category faultlines enhance feelings of isolation, threat, or even dis-identification will lead to individuals in minority membership subgroup viewing the team more negatively (Hogg, 2001) and see the team as an unwelcoming, even threatening, context in which to enact voluntary and interpersonally risky behaviors such as leadership. Because the majority is likely to maintain a positive perception of the team internal environment, the experiences of a faultline based on minority membership are unlikely to drive large changes in overall team internal environment. However, minority members are unlikely to perceive the team safe for engaging in leadership behaviors. Research has found that, by contrast, perceived demographic similarity with others increases proactive behaviors in organizational newcomers (Kammeyer-Mueller, Livingston, Liao, 2010). Similar work has found that teams with positive trust evaluations (e.g., a positive team internal environment) are more proactive and interactive (Clark, Clark, & Crossley, 2010). Further, Kirkman and colleagues (2004) also found that when team leaders are dissimilar from team members those team members viewed the leader's behavior and effectiveness more negatively. Therefore, I hypothesize that:

> *Hypothesis 6: Surface-level diversity moderates the positive relationship between team internal environment and shared leadership such that the relationship will be weakest in teams characterized by a majority subgroup and a minority subgroup compared to completely homogeneous or completely heterogenous teams.*

Methods

Participants

This study uses archival data available from an ongoing research study collected from two universities in the southeastern United States. Sixty-six (66) three-person teams participated in a cooperative, multiplayer online game called Artemis: Spaceship Bridge Simulator. This platform is designed to be played by three or more individuals who must work together to accomplish game objectives. During the study, research participants interacted separately within the virtual environment and also communicated verbally to coordinate, collaborate, and effectively achieve mission success.

Procedure

All participants were recruited through SONA Systems and no restrictions were placed on participation due to the importance of diversity and random assignment within the collected samples. All three participants were required to run a session and at the beginning of each experiment they were assigned to one of three team roles: Helms Officer, Weapons Officer, or Science/Engineering Officer. Each role plays a unique and specific role during the missions and team members must work together effectively to succeed. No leader was assigned and as part of the research protocol, experimenters emphasized verbally that there was no formal

leader. All participants went through training relevant to their role, how it interacts with other roles, and general information about Artemis and their missions.

Teams were asked to complete two missions and their verbal communication was recorded during both. During the research session, participants completed three surveys: an individual differences survey, and two surveys analyzing their experiences and perceptions after each mission.

Table 1 – Study Timeline

Phases of Study
1. Informed Consent
2. Survey 1 (Team Orientation, Preference for Hierarchy, Surface-Level Diversity, Controls)
3. Artemis Role & General Training
4. Artemis Mission 1 (Team Socialization Behaviors)
5. Team Process Survey 1 (Team Internal Environment)
6. Artemis Mission 2
7. Team Process Survey 2 (Shared Leadership Emergence)
8. Debrief and Release

Artemis. Artemis Spaceship Bridge Simulator is a multiplayer computer game (Robertson, 2012). This game simulates a multi-person environment in which individuals must work together on a variety of tasks on multiple computer "workstations" in the style and spirit of Star Trek. These computers are all linked in a local area network to a central server computer that provides the game space that the players interact within. To effectively complete their missions, participants must work together using three roles (Helms Officer, Weapons Officer, Science/Engineering Officer) to defeat enemy spaceships and defend their own

territory and civilian ships. This program simulates the action-oriented, high-stakes experiences that many real life swift acting teams must face.

Measures

Team Orientation (T1). Team orientation was measured using the five-point Likert scale (Strongly disagree – Strongly Agree) created by Driskell, Salas, and Hughes (2010). This scale is based on 15 items that measure two specific sub-components of team orientation: affiliation and dominance. These items include items such as, "*When solving a problem, it is important to make my own decision and stick by it.*", "*I can usually perform better when I work on my own.*", and "*I find working on team projects to be very satisfying*.". The internal reliability of this scale has been previously found to be acceptable (Cronbach's $\alpha > .80$). The observed reliability for this scale in this study was $\alpha = .641$. The observed reliability for the affiliation subscale of team orientation was $\alpha = .524$ while the observed reliability of the dominance subscale was $\alpha = .707$.

Team Preference for Hierarchy (T1). Team preference for hierarchy was measured using an adapted version of Earley and Erez's (1997) power distance scale. This eight item, five-point Likert scale (Strongly disagree to Strongly Agree) includes such items such as, "*Employees should not express disagreements with their managers*" and "*Managers who let their employees participate in decisions lose power*.". Internal reliability has been found to be acceptable in previous studies

(Cronbach's α = .74, Brockner et al., 2001). The observed reliability for this scale in this study was α = .676.

Team Surface-level Diversity (T1). Team surface-level diversity was measured as a composite of demographic variables that included gender, nationality, and ethnicity, because these factors can be obvious indicators of difference or similarity (e.g., accent, different style of dress) within the group. There were two diversity metrics used for these analyses: Blau's index and team categorization.

Blau's index. These surface-level diversity metrics were calculated using an average of Blau's indices (Solanas, Selvam, Navarro, & Leiva, 2012). The formula for a Blau's index is $(1-\sum p_k^2)$ where p is the proportion of members of in *kth* category (Blau, 1977; Solanas et al., 2012). Blau's index reflects the chance that two randomly selected group members belong to different categories. Due to the fact that we are looking at multiple group memberships (e.g.,race, gender, and nationality) we operationalize surface-level diversity using the average ratio computed across each of these categories.

Team categorization. Teams were coded into three categories to account for demographic faultlines based on whether they are (1) completely homogenous (i.e., same gender, same nationalities, and same races), (2) completely heterogenous (i.e., non-homogenous in gender, three different nationalities, and three different races), or (3) formed by two subgroups (i.e., two people with same nationality, gender, and race and one minority group member sharing none of those categories

in common). This metric is used solely for assessing group-level differences in Hypothesis 6.

Team Socialization Behaviors (T2). The team communication recordings were transcribed and behaviorally coded by two expert raters. These raters coded all transcribed communications on whether or not they represent a socialization behavior (e.g., the behavior was socially oriented and not task oriented) and the number of instances of socialization behaviors were used in final analyses. The categories of social behaviors that were coded are as follows:

Table 2 – Coding Categories and Definitions

Category	Definition	Example
Individual Consideration	Showing respect for the feelings and viewpoints of others during taskwork communication.	"If you can go near, thank you"
Morale Boosting	Making jokes or lighthearted comments to boost spirits and morale.	"This is cool." and "(laughing) yea we are trying over here, they are pretty good" and "(laughing) We are not dead yet."
Small talk	Engaging in light, off task communication.	"Hello, team!"
Appreciating Others	Verbalizing appreciation for the contributions of others.	"You got two of them, nice" and "Good work"

Individual consideration is defined as showing respect for others while engaging in other, mission-related conversation. This can include asking team members for assistance or providing instructions but doing so in a way that also fulfills personal needs (e.g., providing direction and then thanking them pre-emptively). Morale boosting is a rapport-building behavior that makes light of or

attempts to boost the spirits and ensure that the team does not become overly frustrated or despondent when faced with setbacks or challenges in a way that can reduce feelings of failure and protect the bonds between team members from fraying in the face of adversity. Small talk is a rapport building technique that acts as social lubrication, essentially reducing the perceptions of separateness by chit-chatting in an off-task manner that doesn't otherwise impact or relate to the team's goals. Finally, appreciating others is verbalizing appreciation to other team members for their actions during task performance phases. The sum of all raw counts of these behaviors will be calculated into a single, composite, "socialization score", which were used in all final analyses. More details regarding the results of the coding are provided in the results section.

Team Internal Environment (T3). Team internal environment was measured through multiple sub-scales adapted for the purpose of providing a thorough sampling of the positivity of the team's internal environment perceptions. These scales include perceptions of voice (Brockner et al., 2001), team psychological safety (Edmonson, 1999a), and team potency (Collins & Parker, 2010). Sample items include: *"My views were taken into account by this team."* (Voice), *"It is safe to take a risk on this team."* (Psychological safety), and *"My team can get things done when it works hard."* (Team potency). Each of these scales has been previously used and validated in the research with adequate reliability (e.g., Cronbach's $\alpha > .80$). The overall observed reliability for Team Internal Environment was $\alpha = .927$.

Shared Leadership Emergence (T4). Shared leadership emergence was examined through a sociometric self-report scale validated in previous research (Scott, 2014) in which team members are asked to rate the extent to which they relied on each other team member during the previous task. Specifically, for each other team member they rated their agreement to a single 5-point Likert scale item (i.e., "I relied on X's leadership during the mission). The sum of every member's ratings are combined into a single number and then divided by the total possible sum (e.g., a strong agreement rating is 5, if every team member rates a strong agreement rating or every other team member the total sum is 45). This creates a ratio describing the network density of leadership. Network density represents the fullness or completeness of the connections between nodes (in this case, people; Gockel & Weth, 2010). For this study, the density reflects the continuum of leadership within a group between fully shared leadership (1) and no leadership (0).

Control Variables (T1). In order to control for certain contextual or irrelevant factors related to the emergence of leadership during this session, four variables have been selected as control variables. These variables include a measure of a video game experience (i.e., how experienced with video games an individual is), extraversion (e.g., how energetic and socially oriented an individual is), agreeableness (e.g., a measure of an individual's orientation towards consideration, friendliness, and maintaining social harmony; Bell, 2007), and propensity for trust (e.g., an individual's general tendency to trust others; Jarvenpaa et al., 2004).

Extraversion (Judge, Bono, Ilies, & Gerhardt, 2002) and past experience with video game tasks are likely to both be related to leadership emergence in this study and must be accounted for to examine the independent effects of this study's hypothesized relationships. Agreeableness and propensity for trust are likely to impact the team's internal environment and thus their impact needs to be controlled for. Agreeable individuals have been found to be better at interpersonal facilitation (Hurtz & Donovan, 2000) and are motivated to create positive social situations (Graziano, Hair, & Finch, 1997). Propensity for trust has also been found to relate to interpersonal helping and positive social exchange as well as the valence of an individual's perceptions of a social situation (Colquitt, Scott, & LePine, 2007).

Video game experience. To measure video game experience, participants were asked to rate how often they played video games on a five-point Likert-scale (Not at all – Every day). Each item on this behavioral frequency scale was averaged to create a final measurement of how much video game experience a person has had.

Personality measures. To measure extraversion and agreeableness, the MINI-IPIP Big-Five personality scale was used. This is a shortened version of the NEO-PI-R (Donnellan, Oswald, Baird, & Lucas, 2006). It is a 20-item, 5-point Likert scale with acceptable levels of reliability for all of its sub dimensions (Cronbach's $\alpha > .70$). Example items include, "I am the life of the party", "I talk to a lot of different people at parties or gatherings", and "I don't talk a lot.".

Propensity for trust. Propensity for trust was measured using the instrument previously developed by Schoorman, Mayer, and Davis (1996a) and has been found to have acceptable reliability (Cronbach's $\alpha > .80$). Example questions from this scale include, "One should be very cautious with strangers," and "Most people can be counted on to do what they say they will do." The observed reliabilities for each of these control variables was in the acceptable region (Cronbach's $\alpha > .70$) except for propensity for trust which had a Cronbach's $\alpha = .657$.

Analyses

Descriptive statistics (e.g., distribution of scores, mean, standard deviation) were calculated for all tested variables and control variables. To examine the hypothesized relationships tested within this research, multiple regression techniques will be used to test the mediated and moderated linkages between variables. Hayes (2012) PROCESS macro allows us to examine not only mediated regressions but also moderations and complex multiple regression models. This technique allows us to estimate the direct and indirect effects of independent on dependent variables. This approach to moderated mediation is superior to Baron and Kenny's (1986) approach because PROCESS macro does not assume normality of the sample distribution, mediated and moderated effects can be directly estimated and tested, and the PROCESS macro utilizes a bootstrapping methodology that provides a clearer picture of the pattern of results. Additionally, bootstrapping techniques provide more statistical power than do the Baron and

Kenny approaches (Hayes, 2012). The list of hypotheses and the analyses used to test them are below:

Table 3 – List of Analyses

List of Hypotheses and Chosen Analysis Methods
1. Hypothesis 1: Linear multiple regression
2. Hypothesis 2: PROCESS Model 1 (Moderated regression)
3. Hypothesis 3a: Linear multiple regression
4. Hypothesis 3b: PROCESS Model 4 (Mediated Regression)
5. Hypothesis 4a: Linear multiple regression
6. Hypothesis 4b: Linear multiple regression
7. Hypothesis 4c: PROCESS Model 6 (Serial Mediated Regression)
8. Hypothesis 5a: Linear multiple regression
9. Hypothesis 5b: Linear multiple regression
10. Hypothesis 5c: PROCESS Model 6 (Serial Mediated Regression)
11. Hypothesis 6: PROCESS Model 1 (Moderated Regression)

Results

Sample Description

The archival data used for this research was collected from two experimental locations in the southeast of the United States and included one hundred and ninety-eight (198) individuals across sixty-six (66) teams. The sample of participants was extremely diverse within a large percentage of teams. In terms of gender composition, 68.5% of the sample was male while 31.5% of the sample was female. In terms of racial composition, 53.7% (N = 107) of the sample was white, 11.5% (N = 23) were Black or African, 11.0% (N = 22) were Hispanic, 9.5% (N = 19) were Asian, and 5% (N = 10) were Middle Eastern. The remaining 9.5% of participants (N = 17) were multiple or other racial categories (see table 4).

Table 4 – Participant Sample Statistics

Gender	**N (Percentage)**
Male	135 (68.5%)
Female	62 (31.5%)
Race	N (Percentage)
Asian	19 (9.5%)
Black/African	23 (11.5%)
Hispanic/Latino	22 (11.0%)
Middle Eastern	10 (5.0%)
White	107 (53.5%)
Other	17 (8.5%)
Total Sample	198 (100%)

Table 5 – Team Sample Statistics

Race Composition	**Number of Teams (%)**
Racially Homogeneous	11 (16.7%)
Racially Heterogenous	19 (28.8%)
Majority-Minority	36 (54.5%)
Gender Composition	66 (100%)
Male Team	32 (48%)
Female Team	12 (18%)
Mixed Gender Team	23 (34%)
Total Teams	66 (100%)

Descriptive Statistics

Means, standard deviations, and the reliabilities of the variables used in this study are reported below in Table 6 and 7 for individual and team levels of analysis. Overall, the internal consistency of the scales used achieved a moderate level of reliability. However, some scales reported a lower level of reliability than had previously been reported in the research (e.g., Team Orientation, Power Distance). This may be due to a mixture of low sample size for those scales and the highly diverse nature of the participant pool. Unfortunately, over the course of the data collection period, participants were not consistently asked the same questions and scales which led to differing numbers of participants to be used for each variable. Additionally, a significant amount of vocal data was missing, reducing to nearly half the amount of missions which could be analyzed for socialization utterances.

Justification for Construct Aggregation

As part of establishing the justification for aggregating the results from a psychometric tool designed to measure consensus-based constructs at individual-level, we must first determine whether it's appropriate to do so. If one is looking to represent a shared construct at the team level based on an aggregation of individual perceptions of that shared construct, evidence that consensus and adequate sharedness exist should be provided (Brahm & Kunze, 2012). However, many of the variables in this study are not consensus-based and therefore do not require the use of aggregation statistics.

More specifically, socialization behavior is a behaviorally coded objective variable that naturally exists at the team level, and shared leadership was measured using sociometric techniques, neither of which are methods that are amenable to or require aggregation statistics. For the trait-based compositional constructs captured used team mean in this study (i.e., team orientation, surface-level diversity, agreeableness, preference for hierarchy), the concepts are not theoretically consensus-based (e.g., it is not expected that team members will demonstrate sharedness in team orientation, and the referent of these items is the self, not the team) and therefore aggregation statistics are not meaningful or necessary. In other words, the team-level aggregation of these measures is intended to represent the existence of various individual differences as a team-level composition variable, and no sharedness or consensus is expected or required.

However, team internal environment does represent a construct that conceptualizes sharedness and consensus (Brahm & Kunze, 2012). Therefore, the scales aggregated into a team-level measure of team internal environment (i.e. voice, team potency, shared support, and shared purpose) must be shown to be adequately shared across people within those teams. Therefore, an Intra-Class Coefficient (ICC) can be used as a measure of reliability of the construct at the team level (Landers, 2015). In short, ICCs are measures of sharedness across the class of constructs or items you are looking to assess within the groups you are examining. Previous research on similar constructs in virtual team contexts has suggested that an ICC of .18 or higher suggests a consensus-based construct is suitable for aggregation (Brahm & Kunze, 2012). The constructs included in the TIE average were team voice climate, psychological safety, and team potency and were found to have an adequate ICC to suggest aggregation is appropriate, ICC(1,80) = .40. Therefore, it is reasonable to aggregate TIE to the team level (Landers 2015).

Table 6 – Individual-level Descriptives

Study Variables	**N**	**Mean**	**SD**	**Cronbach's α**
Team Orientation	63	3.36	.40	.641
Preference for Hierarchy	198	2.73	.51	.676
Team Potency	80	3.52	.91	.913
Psychological Safety	137	3.89	.60	.925
Voice Climate	197	4.2	.69	.890
Overall TIE Aggregate	153	3.84	.76	.927

Control Variables	N	Mean	SD	Cronbach's α
Agreeableness	198	3.91	.70	.715
Extraversion	198	3.22	.94	.800
Video Game Experience	198	2.48	.89	.862
Propensity for Trust	78	2.76	.55	.657

Table 7 – Team-level Descriptives

Experimental Variables	K	Minimum	Maximum	Mean	SD
Diversity Ratio	66	0.00	.58	.29	.14
Socialization	35	0.00	22.00	3.54	5.32
Utterance					
Shared Leadership	66	.47	.97	.76	.11
Density					
Team Internal Environment	51	2.87	4.83	3.84	.44
Team Preference for Hierarchy	66	2.92	4.41	3.77	0.30
Team Orientation	26	1.94	3.33	2.66	.31
Control Variables	**K**	**Minimum**	**Maximum**	**Mean**	**SD**
Extraversion	66	2.00	4.58	3.22	.54
Agreeableness	66	2.75	4.83	3.91	.47
Propensity for Trust	26	2.00	3.50	2.76	.35

Table 8 – Individual-level Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Video Game Experience	*0.86*									
2. Propensity for Trust	0.12	*0.66*								
3. Extraversion	-0.09	0.10	*0.80*							
4. Agreeableness	-0.04	-0.03	0.19**	*0.72*						
5. Overall TIE	0.18*	-0.08	-0.02	0.02	*0.93*					
6. Psychological Safety	0.23**	-0.12	-0.02	0.16	0.86**	*0.93*				
7. Team Potency	0.19	-0.05	0.13	0.11	0.79**	0.54**	*0.91*			
8. Voice Climate	0.10	-0.22	0.01	0.06	0.80**	0.53**	0.31**	*0.89*		
9. Preference for Hierarchy	0.03	0.33**	-0.01	-0.21**	-0.02	0.01	0.05	-0.09	*0.68*	
10. Team Orientation	0.20	0.19	0.08	0.21	-0.01	-0.11	-0.11	0.0	-0.13	*0.64*
M	2.49	3.08	3.23	3.04	3.84	3.89	3.52	4.20	2.73	3.36
SD	0.89	0.42	0.94	0.42	0.76	0.60	0.91	0.69	0.51	0.40

Note: *** = $p < .05$, **** = $p < .01$, *TIE = Team Internal Environment*; Cronbach's Alphas for each variable are italicized along the diagonal.

Table 9 – Team-level Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Agreeableness	*0.72*									
2. Extraversion	0.14	*0.80*								
3. Average video game experience	-0.17	-0.18	*0.86*							
4. Propensity for Trust	-0.05	0.07	0.27	*0.66*						
5. Team Orientation	0.27	0.13	-0.22	-0.22	*0.64*					
6. Team Diversity Index	-0.07	-0.05	-0.10	-0.10	0.07	-				
7. Team Socialization	-0.01	0.23	-0.05	-0.05	0.62*	-0.19	-			
8. Overall TIE	0.15	0.05	0.02	0.02	-0.08	-0.35**	-0.14	*0.93*		
9. Preference for Hierarchy	-0.45**	-0.08	0.05	0.53**	-0.21	0.14	0.20	-0.22	*0.68*	
10. Shard Leadership	0.24*	0.17	-0.07	0.07	0.31	-0.31*	-0.07	0.47**	-0.10	-
M	3.09	3.23	2.76	2.49	*2.66*	0.29	3.54	3.84	3.77	0.76
SD	0.47	0.54	0.35	0.61	0.31	0.14	5.32	0.44	0.44	0.11

Note: * = *p* < .05, ** = *p* < .01, *TIE = Team Internal Environment*; Cronbach's Alphas for each variable are italicized along the diagonal where applicable.

Qualitative Coding Results. The qualitative nature of the socialization variable required a rigorous approach. To ensure the quality of the coding process, a second expert in qualitative analysis assisted in developing the coding process and identifying utterances which would meet the criteria to be included as a socialization utterance. Each rater was trained in the coding categories and shown examples for each coding category before coding each transcript separately. After finishing transcription, the two raters came back together to review their transcript codes and come to consensus on the final coding for every transcript. Unfortunately, while there was variance across teams in terms of the number of social utterances, the raw number of utterances across all teams were lower than anticipated. In the table below, each utterance category is listed with the total number of utterances given across all teams as well as the range of utterance counts within teams.

Table 10 – Utterance Counts

Utterance Category	Total Utterances	Range Within Teams
Individual Consideration	14	0 to 3
Morale Boosting	51	0 to 11
Small Talk	35	0 to 6
Appreciating Others	24	0 to 7
Other Socialization	45	0 to 13
Negative Statements	7	0 to 4

Of note, however, is that socialization behaviors increased in incidence during the latter half of the team's missions. This may mean that early on, when conversation is highly task-focused, the teams felt overwhelmed by the interdependency of their tasks and socialization was put as a second priority until

the teams start to better understand their tasks and mission. There were different patterns in terms of the use of socialization by team members. Individual consideration, Appreciating Others, and Small Talk all were used at a low rate throughout the whole mission. However, Morale Boosting was the most common kind of socialization behavior and consisted mostly of joking about performance or engaging in encouragement after a setback in their scenario. This tended to occur in the later stages of the teams' missions.

Hypothesis Testing

To test this study's hypotheses, multiple linear regression methodologies were used to test the significance and effect size of the relationships between the study's experimental variables. Control variables included included team-level video game experience, team-level average extraversion and agreeableness, as well as team-level propensity for trust. These control variables were included in analyses when they correlated with the dependent variable being assessed.

Hypothesis 1. Hypothesis 1 predicted that a team's internal environment (TIE) during mission 1 would positively relate to the emergence of shared leadership during mission 2. Due to the fact that agreeableness was correlated with shared leadership (see Table 9), that control variable was included in the analysis. Multiple linear regression was used to calculate the overall effect of TIE and the separate impact of team-level agreeableness.

TIE during mission 1 was found to be a significant predictor of shared leadership emergence, $F(2, 63) = 10.339$, $p < .01$, with an R^2 of .22. The overall model explaining 22.3% of the variance in shared leadership after mission 2, $\beta = .438$, $R^2 = .19$. The control variable, agreeableness, was not a significant predictor of shared leadership emergence in this regression equation ($\beta = .176$, $p = .116$). Therefore, hypothesis 1, that team internal environment positively relates to the emergence of shared leadership, was supported.

Hypothesis 2. Hypothesis 2 predicted that a team's preference for hierarchy would moderate the relationship between team internal environment and shared leadership emergence. Agreeableness was added to this model as a control variable because of its statistically significant relationship with shared leadership. A moderated regression was conducted using Haye's (2013) PROCESS macro for SPSS. The overall model remained a significant predictor of shared leadership $F(4,61) = 5.43$, $p < .01$ and TIE remained a significant predictor of shared leadership ($\beta = .13$, $p < .01$), but the influence of preference for hierarchy was non-significant (ß = .05, $p = .33$), as was the interaction term ($\beta = .09$, $t(61) = 3.98$, $p = .46$). The control variable, agreeableness also remained a non-significant predictor ($\beta = .05$, $t(61) = 1.91$, $p = .06$; see Table 10). Both of these analyses were also conducted using a traditional regression approach and the findings remained non-significant. As a supplemental analysis, these analyses were re-run using the standard deviation of preference for hierarchy as a control variable due to the construct's compositional nature. No statistically significant changes to the model

were found in doing so. Based on these findings, Hypothesis 2, that preference for hierarchy would moderate the relationship between TIE and shared leadership emergence, was not supported.

Table 11 – Hypothesis 2 Model Results

Model Variables	Coef.	T	P	LLCI	ULCI
Constant	0.55	4.88	.000	.32	.77
Team Internal Environment	.13	3.98	.000	.06	.19
Preference for Hierarchy	.05	.99	.33	-.05	.14
Int_1 (TIE x PH)	.09	.74	.46	-.15	.33
Agreeableness (Control)	.05	1.91	.06	-.002	.11

Hypothesis 3. Hypothesis 3 was made up of two sub-hypotheses. Hypothesis 3a posited that team socialization behaviors (TSB) would positively relate to perceptions of the team's internal environment (TIE). Hypothesis 3b posited that TIE would mediate a positive relationship between TSB and shared leadership emergence. To test hypothesis 3a, a multivariate linear regression was conducted. For hypothesis 3b, a mediated regression was conducted using PROCESS Model 4. Agreeableness was entered into this analysis as a control variable but was found not to have a significant impact on the overall model.

Team socialization behaviors (TSB) were not significantly related to TIE $F(1,33) = 0.683$, $\beta = -.14$, $p = .42$, therefore, Hypothesis 3a was not supported. For hypothesis 3b, the overall model was significant $F(2, 32) = 7.92$, $p < .01$, with an $R^2 = .33$. However, socialization was not a significant predictor of shared leadership emergence (B = .000, $t(32) = .06$, $p = .95$. TIE remained a significant predictor of

shared leadership emergence (B = .18, $t(32) = 3.95$, $p < .01$). The indirect effect between team socialization behavior and shared leadership emergence was also non-significant, with the effect including 0 (LLCI = -0.01, ULCI = 0.01). Therefore, neither Hypotheses 3a nor 3b was supported.

Hypothesis 4. Hypothesis 4 is based upon three sub-hypotheses. Hypothesis 4a posits that team orientation positively relates to team socialization behaviors. Hypothesis 4b states that team orientation will also be positively related to team internal environment. Lastly, hypothesis 4c predicts that the relationship between team orientation and shared leadership will be mediated sequentially by team socialization and team internal environment. For hypotheses 4a and 4b, a simple linear regression was conducted to identify the estimates for significance and effect. Team-level team orientation was significantly related to team socialization behaviors $F(1, 11) = 7.00$, $\beta = .624$, $p < .05$, and predicted 38.9% of the variance in team socialization, therefore, Hypothesis 4a was supported. However, this significant relationship is based upon a low number of cases (K = 12) which carries the risk of spurious findings.

Team orientation was not significantly related to TIE $F(1,24) = .159$, $\beta = -0.08$, $p = .69$, and accounted for less than 1% of the variance in team internal environment, therefore, Hypothesis 4b was not supported. Lastly, for hypothesis 4c, Hayes' PROCESS model 6 was used to explore if team socialization behaviors and team internal environment sequentially mediate the relationship between team orientation and shared leadership. Agreeableness was included in this analysis as a

covariate due to its correlation with the dependent variable (shared leadership) but did not affect the overall model. The results from the sequential mediation analysis show that team orientation is neither directly nor indirectly statistically significantly related to the emergence of shared leadership (see Figure 3). The standardized regression coefficient between TO and shared leadership emergence was not statistically significant $t(9) = .18$, $p = .06$, with the confidence intervals including zero (LLCI = -0.01, ULCI = 0.39). The total indirect effects of team orientation on shared leadership was also not statistically significant (B = -.10) with the confidence intervals of indirect effects also including zero (LLCI = -0.39, ULCI = 0.6). Therefore, hypothesis 4c was not supported. A supplemental series of analyses using the standard deviation of team orientation as a control were also conducted with no statistically significant changes in the results found.

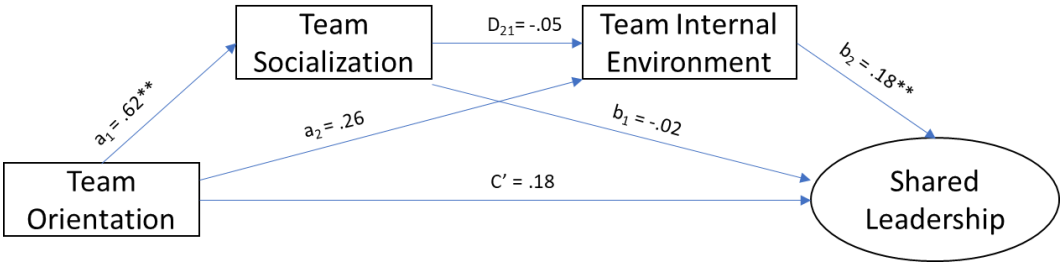

Figure 3 – Hypothesis 4 Sequential Mediation Model Results

Hypothesis 4 Exploratory Analyses. Because team orientation is composed of two sub-dimension (need for affiliation and desire for dominance) two exploratory sequential mediation analyses were conducted. These analyses examine each sub-dimension of team orientation separately to tease apart any differences

between the two in terms of functioning in the model. Overall, the direct effect of affiliation (C') remains a statistically significant predictor of shared leadership even when accounting for the total effect of the model (B = .19, $p < .05$) with the lower and upper confidence intervals not including zero (LLCI = .014, ULCI = .37). Affiliation alone was also found to not be a statistically significant predictor of total team socialization (B = .48, $p = .09$). For the dominance sub-dimension, dominance alone did not statistically significantly relate to any of the other variables in the model.

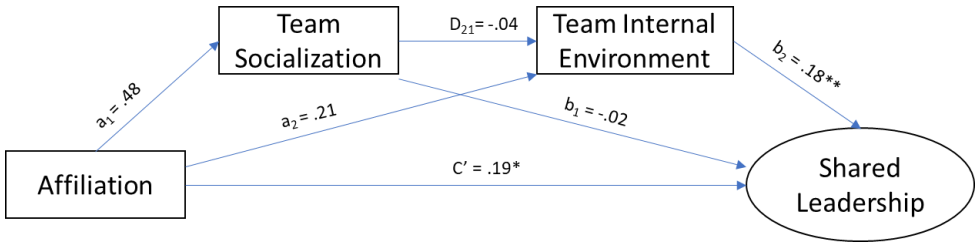

Figure 4 – Exploratory Model Results - Affiliation

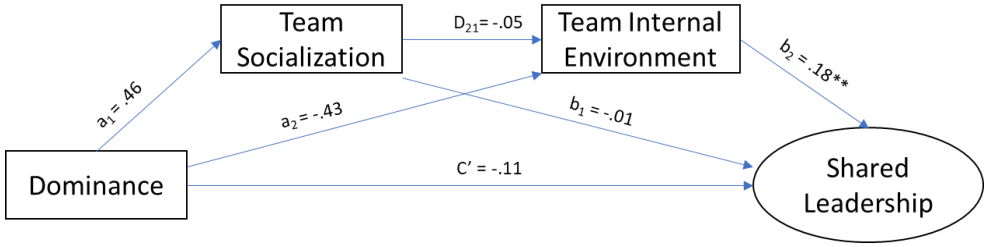

Figure 5 – Exploratory Model Results – Dominance

Hypothesis 5. Hypothesis 5 contains three sub-hypotheses. Hypothesis 5a states that surface-level diversity will be negatively related to team socialization behaviors. Hypothesis 5b predicts that surface-level diversity will be negatively related to perceptions of the team's internal environment. Lastly, hypothesis 5c

states that the negative relationship between surface-level diversity and shared leadership emergence will be mediated sequentially by team socialization behaviors and team internal environment.

Hypotheses 5a and 5b were tested using a simple linear regression framework while Hypothesis 5c was tested using Hayes (2013) PROCESS Model 6 to test for sequential moderation. For Hypothesis 5c, agreeableness was again used as a control variable but no significant impacts by agreeableness on the model was found. The relationship between surface-level diversity and team socialization behavior was not statistically significant $F(1,33) = 1.22$, $p = .27$) with the model predicting less than 1% of the variance in team socialization behavior, therefore, Hypothesis 5a was not supported. The relationship between surface-level diversity and team internal environment was statistically significant $F(1,64) = 9.11$, $p < .01$ and surface-level diversity had a moderate effect on team internal environment (β = -.35), therefore Hypothesis 5b was supported, though the variance accounted for by the model as a whole was 11% (R^2 = .11). Finally, the statistically significant relationship between surface-level diversity and shared leadership emergence was mediated by team internal environment, $F(3,31) = 5.16$, $p < .01$), but not by team socialization behaviors therefore, hypothesis 5c cannot be supported. However, that the strong total effect of surface-level diversity on shared leadership (B = -.31, p = .01) became nonsignificant after adding team internal environment and team socialization behavior to the model (B = -*.06,* p = .63) with upper and lower confidence intervals including zero (LLCI = -.34, ULCI = .21) suggests that a

simple mediation model using team internal environment in place of a more complex sequential mediation model may be more appropriate. Therefore, based on these analyses, Hypotheses 5a and 5c were not supported but 5b was supported.

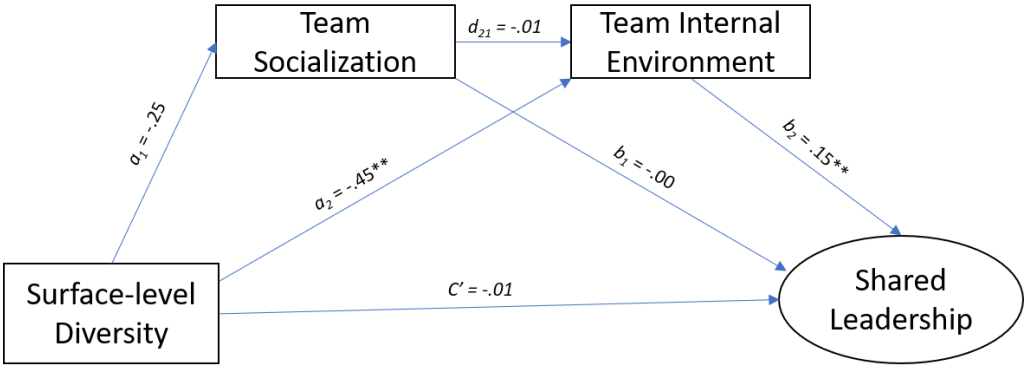

Figure 6 – Hypothesis 5 Sequential Mediation Model Results

Hypothesis 6. Hypothesis 6 states that surface-level diversity will moderate the positive relationship between team internal environment and shared leadership such that in teams characterized by majority and minority groups the relationship will be weaker than when compared to completely homogeneous or completely heterogeneous teams. Teams were categorized using the following method: (1) Teams are homogenous if all team members shared the same racial background and gender, (2) Teams are heterogenous if no member is of the same racial background, and (3) teams are composed of majority and minority groups if only two members share the same racial background and gender. Hayes (2013) Process Model 1 was used to perform a moderated regression analysis. The process macro allows for multicategorical variables to be used as predictors or moderators (Hayes, 2013).

Because of this, no dummy coding was conducted within the dataset. The process macro works by it tests the overall model and then provides effect sizes based on the sub-group analyses of each category represented by the moderator.

Agreeableness was added as a covariate to the analysis due to its significant relationship with shared leadership emergence. Hypothesis 6 is not supported as team diversity categories were not a significant predictor of shared leadership emergence $t(61) = -1.54$), B = .05, $p = .33$. The control variable of agreeableness was also not a significant predictor of shared leadership emergence in this model $t(61) = 1.46$, B = .04, $p = .15$. Lastly, the interaction between team internal environment and surface-level diversity faultlines was not significant $t(61) = -.97$, B = -.05, $p = .34$. However, the overall model remains significant $F(4,61) = 6.35$, $R^2 = .30$, $p < .01$ with team internal environment remaining a significant predictor of shared leadership emergence $t(61) = 4.00$, B =.11, $p < .01$. Therefore, Hypothesis 6 was not supported (see Table 12 for individual variable estimates).

Table 12 – Hypothesis 6 Model Results

Model Variables	Coeff.	T	P	LLCI	ULCI
Constant		6.05	0.00	0.41	0.82
Team Internal Environment	0.12	4.00	0.00	0.06	0.18
Overall Team Categories	-0.03	-1.54	0.13	-0.06	0.01
Int_1 (TIE x Diversity Categories)	-0.05	-1.00	0.33	-0.14	0.05
Agreeableness (Control)	0.04	1.46	0.15	-0.01	0.09

Table 13 – Summary of Findings

Hypothesis	Outcome
Hypothesis 1: Team Internal Environment relates to shared leadership.	✓ Supported
Hypothesis 2: Preference for Hierarchy moderates the relationship between team internal environment and shared leadership.	X Not Supported
Hypothesis 3a: Team socialization positively relates to team internal environment.	X Not Supported
Hypothesis 3b: Team internal environment mediates the relationship between team social behavior and shared leadership.	X Not Supported
Hypothesis 4a: Team orientation is positively related to team socialization.	✓Supported
Hypothesis 4b: Team orientation is positively related to team internal environment.	X Not Supported
Hypothesis 4c: Team orientation's relationship with shared leadership is mediated by team internal environment and team socialization.	X Not Supported
Hypothesis 5a: Team surface-level diversity is negatively related to team socialization.	X Not Supported
Hypothesis 5b: Team surface-level diversity is negatively related to team internal environment.	✓Supported
Hypothesis 5c: Team surface-level diversity's relationship with shared leadership is mediated by team internal environment and team socialization.	X Not Supported
Hypothesis 6: Team faultlines will moderate the relationship between team internal environment and shared leadership emergence.	X Not Supported

Discussion

This research helps to build a deeper understanding of the precursor factors that build a foundation for highly effective teams. While not directly examining team effectiveness, past research has thoroughly shown that shared leadership is an important predictor of both effectiveness and performance outcomes (Nicolaides et al., 2014, Wang et al., 2014). However, relatively little research has examined the factors supporting the natural emergence of shared leadership in teams. Therefore, this research was conducted to provide evidence of what organizations should focus on to build maximally effective teams based on shared leadership principles.

Accordingly, the goal of this research was to explore the boundary conditions and team properties that impact the swift formation of shared leadership to provide clarity and direction for team formation. This study is also a replication and extension of Carson and colleagues' (2007) findings, complementing them by adding further to the constructs that can be considered a part of a team's internal environment (i.e., psychological safety, potency). In addition, this study is, to my knowledge, the first which has attempted to examine the complex interplay of behavioral factors, team properties, and individual differences with shared leadership emergence within the framework of a single study.

Overall, the results of this study support the critical role that a person's perceptions of the team's internal environment play in fostering shared leadership. Further, we find that these perceptions of a team's environment have nearly immediate impacts on the short-term formation of shared leadership. Additionally,

team-level diversity was found to have a strong negative relationship on the formation of shared leadership through the primary mechanism of lowered perceptions of the team's internal environment. Because the variables were measured at different time points, common method bias is unlikely to be a serious issue. The stability of the relationship between team environment perceptions and shared leadership must still be examined in the longer term. It is likely that only through the repetition of these perceptions can a strong and resilient form of longitudinal shared leadership emerge within the team.

Of the individual differences control variables, only agreeableness strongly correlated with shared leadership emergence, which provides initial support for the propositions set out by Hoch and Dulebohn (2017) regarding the likely positive relationship between team-level agreeableness and shared leadership emergence. Further, while the hypothesized negative relationship between preference for hierarchy and shared leadership emergence was not found, it is possible that agreeableness may be an explanatory mechanism between them. For instance, preference for hierarchy was found to be negatively related to agreeableness, suggesting that agreeableness may capturing variance within preference for hierarchy in relation to shared leadership.

Similarly to preference for hierarchy, team orientation and team socialization did not have an appreciable impact on shared leadership as found by this study. However, due to the low sample size used for those analyses an interpretation of non-significance is cautioned against (e.g., K = 11 for the analysis

between team orientation and team socialization behaviors). The significant correlation between team orientation and team socialization suggest that attempts were made by teams characterized by high team orientation to socialize. However, these social behaviors did not seem to significantly improve perceptions of the team's internal environment, nor directly impact shared leadership emergence.

Team composition in terms of surface-level diversity was found to have a moderate, direct negative relationship with shared leadership emergence. This provides additional support for previous research that has found diversity in teams has a negative impact on positive team processes (e.g., Harrison & Klein, 2007). However, a unique contribution of this study was the finding that when team internal environment was incorporated into the model, there was no longer a remaining direct effect of diversity on shared leadership emergence. So, while Hypothesis 5c could not be supported, that was because it appears that team socialization and team internal environment are not sequentially mediated but instead a simple mediation of team internal environment between surface-level diversity and shared leadership best describes our findings. This suggests that the impact of diversity on shared leadership is due largely to lowered perceptions of team environment, rather than due to differing expectations regarding the nature of leadership.

Limitations

There are two major categories of limitations within this study: lack of sample size and lack of scale reliability. The greatest of these two limitations is

lack of sample size. While this study originally planned to assess 66 teams, it was found that not every analysis could achieve that sample size. Over the course of the data collection, it was discovered that some scales stopped being used and that some physical data had been lost which limited the data points when assessing the joint effects of multiple variables. For example, for hypothesis 4, I assessed team socialization and team orientation's joint impact on shared leadership emergence and found that data for both existed in only 11 out of 66 teams. This data loss was an unforeseen complication hampering the findings of this study. The lower than expected levels of reliability for both the team orientation and preference for hierarchy ($\alpha = .675$) also hindered our analyses.

For instance, this study found that a person's preference for hierarchical leadership did not strongly influence the formation of shared leadership within the team. While no direct or moderating effects for this construct were found in this study, it is possible that this lack of finding may be due to lack of scale reliability leading to a Type II error. However, if the null is true, then this suggests that a person's preference for hierarchy may not have a strong or immediate impact on the shape of the leadership that emerges within the team. This may be due to the fact that deep-level differences between people often take longer to impact team processes than do surface-level differences. Further, the lack of relationships between team orientation and team socialization with team internal environment and shared leadership may be due to lack of power. Similarly, to the scale for preference for hierarchy, the reliability of the team orientation measure was also

lower than expected (α = .641) which further increases the potential for a Type II error. However, if the null finding is accurate, it could be that it takes longer for the deep-level difference of team orientation to impact the team's processes. In addition, it could also be that positive task engagement experiences (e.g., other collaboration processes are effective) are more important to the early formation of shared leadership than are team socialization behaviors. The majority of socialization happens towards the end of the team mission which means it may not have been engaged in long enough to actually change perceptions when compared to team collaboration behaviors.

Team diversity categories (e.g., fully homogeneous, fully heterogenous, and teams with majority-minority faultlines) were not found to moderate the relationship between team internal environment and shared leadership. This study hypothesized that the relationship between team internal environment and shared leadership would be stronger in teams that are either fully homogeneous or fully heterogenous compared to teams which are comprised of two people who are demographically similar and one person who was demographically dissimilar. While it is difficult to interpret the lack of significant findings, it is also likely that this finding is due to a low sample size of fully homogeneous (K = 11) and fully heterogeneous teams (K = 19) compared to the majority of teams containing majority-minority demographic faultlines (K = 36). These patterns were examined looking at both stigmatized racial groups (e.g., black, Hispanic, or Arabic) as well

as gender (e.g., women) when compared to a majority group of white males. No meaningful patterns were found.

Other limitations of this study include the duration of time it was implemented. Over its course of multiple years, this study was led by multiple researchers which resulted in small changes being made that reduced comparability across the lifespan of the experiment. Further, this study is based upon a simulated team study which had not established a priori structures in place to capture the specific types of teams that would have provided exact answers to this study's questions on diversity and socialization. Hoch (2014) suggested that building team belongingness early in a team's lifespan would likely improve the shared leadership within virtual teams. However, a key component of most organizational and team interventions is a structured process with a desired outcome. This study allowed socialization to occur naturally within a context that was artificial and had strong motivators to stay available. Finally, this study is focused on swift-forming action teams who come together on a specific task and break apart. These kinds of teams are common in some areas (e.g., crisis, disaster, or emergency teams) but are not as generalizable to typical long-term teams found within a typical workplace. As such, there was a lack of socialization behaviors found within the sample as most interaction was focused on solving the problems facing the teams.

In addition to the above limitations, this study is also focused on the initial formation of short-term teams. To fully understand the reciprocal nature of the relationship between the factors identified in this model, teams must be studied

over the course of their entire lifetimes. By doing the long term, co-evolving effects that dynamic team processes and emergent states have with each other can be better understood. These effects and co-evolving processes should be researched as much as possible in settings more closely resembling a natural working environment setting to ensure the practical magnitude and relevance of any relationships identified by this work.

Theoretical Implications and Future Research

This research pushes forward the body of knowledge around antecedents and boundary conditions for shared leadership emergence. Future research should take steps to address the weaknesses in this design by creating teams that are composed to ensure adequate numbers of completely homogenous, completely heterogenous, or composed of subgroups to better test the impact of type of team composition on shared leadership. Future research must also be done to collect more and better data around team orientation and team socialization behaviors. It is my belief that the pattern of relationships was suggestive of the theorized framework but that a lack of statistical power hampered the findings of this study.

The findings of this study could help to push forward the science of shared leadership and illuminate answers to how shared leadership emerges. A recent call by Hoch and Kozlowski (2014) warns that future research must identify antecedents, mediators, and moderators of shared leadership. I agree with this assertion as there are many critical factors that may complicate an organization's attempts to foster shared leadership and shared leadership's potential impact on a

team's outcomes likely varies based on team type and team task. This study pushes forward the state of the art in teams research by providing insight into the functioning of complex teams. The findings of this study might especially be useful to apply to global virtual teams research where teams often interact mediated by technology. The impact of cultural diversity may be even stronger in such ambiguous environments where there is little other opportunity for teams to socially integrate and overcome their perceptions of each other as different. Future studies can also examine whether or not instructing teams to socialize or setting up formal socialization interventions significantly change the impact of socialization on our team effectiveness outcomes. It may also be that by explicitly instructing teams to engage in early socialization any benefits might emerge more quickly during team formation. In summary, by providing empirical evidence of the impact of culture and diversity on shared leadership emergence, shared leadership can be better integrated into the full landscape of teams research knowledge and accumulated literature.

Practical Implications

There are several important implications for practitioners from this research. The first and most important of these are that the results of this study suggest that concerns about workforce diversity (Hoch, 2016; Horowitz & Horowitz, 2007) in shared leadership environments are overblown. What really matters when it comes to fostering shared leadership is that perceptions of a team's internal environment be positive.

Overall, the majority of formal organizational interventions focusing on managing the effects of diversity are focused on the individual (Roberson, 2019) but the results of this study suggest that to achieve team-level outcomes we must target team internal environment at both the individual level and the team level. What means more to teams and to talent management for teams is providing interventions that directly improve the entire team's perceptions of their internal environments. This can be done in three major ways: (1) improving onboarding, (2) focusing on teams in addition to individuals, and (3) focus selection on the composition variables that really matter.

Onboarding is a stressful time during a team's lifespan, and it can be daunting to set a team up for success. Set teams up for success by laying down transparent expectations for how people will work together, provide diplomatic and open feedback, as well as providing support and ideas to one another. Put them on track by setting them up for early wins to build their confidence for larger, more difficult challenges.

This can be done by focusing specifically on team building and building esprit de corps within these teams. Interventions should focus on ensuring that there are transparent expectations for people to provide each other diplomatic and open feedback as well as offer their support and ideas to each other. In terms of managing these teams, teams should also be set up for early wins to build their confidence for larger, more difficult challenges. This aligns with the advice given by Day and colleagues (2004) about building leadership capacity within a team.

That way, when a team faces a daunting challenge, they can look back on shared wins that can help keep them working together and sharing leadership even when things look tough. Additionally, as new team members come into the team put an extra focus during onboarding of establishing the team norms and making them understand that the team is a safe and welcoming environment for them. This matters for every new employee or team member but especially for marginalized minorities (e.g., people of color, LGBT individuals). Starting a new job can feel scary, especially when you are worried about bias and prejudice from others.

During the overall lifespan of a team, developmental initiatives should focus on building and maintaining a positive team identity and shared sense of esprit de corps. This can be done by encouraging socialization and openness across team members. While team socialization was not found to relate to shared leadership outcomes in this study, it seems reasonable to assume that socialization over a longer period of time will shape a person's perceptions of their team and their fellow team members.

Finally, these two areas are supported by focusing on compositional variables that really matter for the team outcomes we are looking to foster (i.e., a positive team internal environment and more shared leadership behaviors). Hiring teams should look for people who are team oriented because team orientation does relate to a team's level of socialization. Secondly, hiring teams should also look for people who are not low in agreeableness when building a team that will be encouraged to shared leadership. The relationship of agreeableness (as a control

variable) to shared leadership (see Table 9) suggests that forming teams based on agreeableness may lead to greater overall shared leadership outcomes. This finding, though initial, directly supports some of the propositions brought up by Hoch and Dulebohn (2017). In fact, of our two compositional control variables (agreeableness and extraversion), agreeableness was the only one to have a significant relationship with our shared leadership outcome.

This suggests, contrary to a typical leadership selection criterion, team members should be selected more for their agreeableness than for their extraversion to see the most shared leadership emerge. However, it's also important to remember to be cautious about focusing on "high agreeableness" during the selection process. At it's extreme positive end, agreeableness leads people to prefer "getting along" rather than "standing out or standing up" and are less likely to engage in leadership behaviors, stand up for their perspectives and ideas, or call out concerns out of concern for others. Therefore, it's likely going to be important that hiring teams use both prosocial individual differences (e.g. agreeableness) as well as agentic individual differenes (e.g. extraversion) in a combined manner when assessing a person's suitability for a shared leadership structure. It's entirely likely that a balance of the two, along with other traits, will lead to the best shared leadership outcomes.

Conclusion

This research used archival data from a simulated team study to examine the factors that lead to higher shared leadership emergence in teams. This research found that surface-level diversity has a negative relationship with both team internal environment and shared leadership. There was a significant indirect effect on the relationship between surface-level diversity and shared leadership by team internal environment. This study also found that deep-level individual differences (e.g., preference for hierarchy, team orientation) did not have the same strong relationships with team internal environment and shared leadership, suggesting that deep-level differences might need more time to impact these team emergent states and processes. This study also found that a team's socialization behaviors did not strongly relate to these outcomes (team internal environment and shared leadership). Based on the results of this study, practitioners should not focus solely on individual differences when selecting team members but must also support the formation of a positive team internal environment if enhancing shared leadership emergence is a priority. Future research should examine the impact of these factors on longer term shared leadership emergence.

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Appendix A: Demographic Measures

Race / Ethnicity

What is your race or ethnic background? (Check all that apply)

1. White/Caucasian, Anglo, European; Not Hispanic
2. Black/African American/African
3. Hispanic or Latino, including Mexican American, Central American
4. Asian or Asian American, including Chinese, Japanese, Indian, Korean, etc.
5. Pacific Islander or Native Hawaiian
6. American Indian
7. Alaskan Native
8. Middle Eastern, including North African, Arabic, West Asian, etc.
9. Other (Fill Blank)

Gender

What is your gender? (Choose one)

1. Male
2. Female
3. Other (Fill Blank)

Birthplace

Where were you born? (City, State; Country if outside the US)

Fill in the blank.

Appendix B: Psychometric Scales

Preference for Hierarchy

For the following questions, please indicate how strongly you agree or disagree with the listed statements.

1. In most situations, managers should make decisions without consulting their subordinates.
2. In work-related matters, managers have a right to expect obedience from their subordinates.
3. Employees who often question authority sometimes keep their managers from being effective.
4. Employees should not express disagreements with their managers.
5. Managers should be able to make the right decisions without consulting with subordinates.
6. Managers who let their employees participate in decisions lose power.
7. Once a decision of a top-level executive is made, people working for the company should not question it.
8. A company's rules should not be broken even when the employee thinks it is in the company's best interest.

Five-point Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Shared Leadership

Please indicate your agreement with the following statements on whose leadership you relied on during the mission.

1. I relied on Helm's leadership during the mission
2. I relied on Weapon's leadership during the mission.
3. I relied on Science and Engineering's leadership during the mission.

Five-point Likert scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Voice climate (Brockner et al., 2001)

Please rate the following statements based on how much you agree with their statements.

1. In this team, I had a lot of opportunity to present my views about how this mission should be resolved.
2. My views were taken into account by this team.
3. What I wanted was considered in arriving at a solution by the team.

Five-point Likert scale: Strongly disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Team Psychological Safety (Edmonson, 1999)

Please rate the following statements based on how much you agree with them.

Five-point Likert scale: Strongly disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

1. It is safe to take a risk on this team.
2. It is easy for me to ask a member of this team or help.
3. I am able to bring up problems and tough issues.
4. People in this team sometimes reject others for being different.
5. No one on my team would deliberately act in a way to undermine my efforts.

Five-point Likert scale: Strongly disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Team Potency (Collins & Parker, 2010)

For the following questions, please rate the following statements based on how much you agree with the statements.

1. My team has confidence in itself.
2. My team can get things done when it works hard.
3. My team believes that it can be very successful.

Five-point Likert Scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

Team Orientation (Driskell, Salas, & Hughes, 2010)

For the following statements, please indicate how strongly you agree or disagree with the listed statements.

1. I find working on team projects to be very satisfying.
2. I would rather take action on my own than wait around for others' input. (R)
3. I prefer to complete a task from beginning to end with no assistance from others. (R)
4. Teams usually work very effectively.
5. I think it is usually better to take the initiative and do something yourself, rather than wait to get input from others.
6. For most tasks, I would rather work alone than as part of a group. (R)
7. I find it easy to negotiate with others who hold a different viewpoint than I hold.
8. I can usually perform better when I work on my own (R)
9. I always ask for information from others before making any important decision (R)
10. I find that it is often more productive to work on my own than with others. (R)
11. When solving a problem, it is important to make my own decision and stick by it (R)
12. When I disagree with team members, I tend to go with my own gut feelings. (R)

13. When I have a different opinion than another group member, I usually try to stick with my own opinion. (R)
14. It is important to stick to your own decisions, even when others around you are trying to get you to change. (R)
15. When others disagree, it is important to maintain your position and not give in. (R)

Five-point Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

**(R) signifies items that must be reverse coded.*

Appendix C: Control Variables

Extraversion MINI-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006)

1. I am the life of the party.
2. I talk to a lot of different people at parties or gatherings.
3. I keep in the background. (R)
4. I don't talk a lot. (R)

Five-point Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

**(R) signifies items that must be reverse coded.*

Agreeableness MINI-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006).

1. I sympathize with others' feelings.
2. I feel others' emotions.
3. I am not really interested in others. (R)
4. I am not interested in other people's problems. (R)

Five-point Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

**(R) signifies items that must be reverse coded.*

Video Game Experience

Based on the past year, how frequently have you played:

1. Any videogames (e.g., PC-based, Nintendo, PlayStation, Wii, arcade)?
2. First-person-perspective videogames, for example: Battlefield 1942, Halo?

3. Simulation-based videogames, for example: Falcon, Microsoft Flight Simulator, Lock On: Modern Air?
4. Online multi-player videogames, for example: EverQuest, World of Warcraft?
5. Action videogames, for example: Grand Theft Auto, NBA, God of War?
6. Command/strategy videogames, for example: Risk, Command and Conquer?
7. Creative development videogames, for example: Sims, Tycoon, Civilization?
8. Puzzle videogames, for example: Minesweeper, Tetris?

Five-point Likert Scale: Not at all, About once a year, About once a month, About once a week, Every day

Propensity for Trust (Schoorman, Mayer, & Davis, 1996a)

For the following statements, please indicate how strongly you agree or disagree with the listed statements.

1. One should be very cautious with strangers. (R)
2. Most experts tell the truth about the limits of their knowledge.
3. Most people can be counted on to do what they say they will do.
4. These days you must be alert or someone is likely to take advantage of you. (R)
5. Most salespeople are honest in describing their products.

6. Most repair technicians will not overcharge people who are ignorant of their specialty.
7. Most people answer public opinions polls honestly.
8. Most adults are competent at their jobs.

Five-point Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

**(R) signifies items that must be reverse coded.*