THE ANTECEDENTS AND OUTCOMES OF INFORMATION ELABORATION

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Because decision making teams are useful only to the extent that they are able to exchange and synthesize information (Hinsz, Tindale, & Vollrath, 1997), one important variable to examine is the way that teams communicate. Team decision making incurs a coordination cost over individual decision making (Brodbeck, Kerchreiter, Mojzisch, & Schulz-Hardt, 2007). Considering this, it seems justified to examine the processes that enable teams to outperform individuals. My dissertation therefore examines the antecedents and outcomes of elaboration. In the 1st chapter of my dissertation, I examine the role of emotional intelligence in affecting elaboration and performance in two contexts: informationally homogeneous and diverse settings. I find that emotional intelligence aids in elaboration and that this translates into better performance in diverse teams. In the 2nd chapter of my dissertation, I introduce the concept of representational gaps—fundamental incompatibilities in team members' definition of the problem and solution space (Cronin & Weingart, 2007)—and devise a new method for measuring them. I then theorize about how they may degrade elaboration and in turn performance. In the 3rd chapter of my dissertation I take a longitudinal lens and explore the outcomes of elaboration. Specifically, I examine how elaborating early on affects team performance over time. I find that teams who elaborate early on grow exponentially and that small advantages are translated into large gains over time. I use laboratory studies of ad hoc teams as well as student teams to examine my hypotheses. I discuss the implication of my findings in terms of what managers can do to improve team communication.

BIOGRAPHICAL SKETCH

Shirley Wang's research focuses on decision making in teams. She studies the barriers that team members can face when working together and factors that can mitigate these barriers. Specifically, her areas of interest are in emotional intelligence, communication, and diversity. Prior to joining Cornell University, she worked as a research assistant at the Federal Reserve Board of Governors and received her BA in economics and mathematics from the University of California in San Diego. After graduating from Cornell University with a PhD, she will be joining Carnegie Mellon as a postdoctoral student and visiting faculty.

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Introduction

Teams are a ubiquitous part of organizations. Today's products—from scientific reports to smartphone apps—are more likely to command a high degree of sophistication. To meet these heightened demands, organizations rely more and more on teams (Devine, Clayton, Phillips, Dunford, & Melner, 1999; Mathieu, Marks, & Zaccaro, 2001). These teams may take the form of task forces, committees, board members, think tanks, or political groups. Team decision making incurs a coordination cost over individual decision making (Brodbeck, Kerchreiter, Mojzisch, & Schulz-Hardt, 2007). Considering this, it seems justified to examine the processes that enable teams to outperform individuals. Because decision making teams are useful only to the extent that they are able to exchange and synthesize information (Hinsz, Tindale, & Vollrath, 1997), one important variable to examine is the way that teams communicate. This is in line with the conceptualization of groups as information processors (Hinsz et al., 1997). It is on this basis that van Knippenberg, de Dreu, and Homan (2004) have coined the term *group information elaboration* which is defined as the "exchange of information and perspectives, individual-level processing of the information and perspectives, the process of feeding back the results of this individual-level processing into the group, and discussion and integration of its implications" (p. 1011).

The present dissertation proposes to explore the antecedents and outcomes of elaboration. This has implications for decision making teams in general, and informationally diverse teams specifically. Informationally diverse teams are attractive because of the fuller range of expertise, knowledge and points of view that they bring to bear on solving complex problems (see van Knippenberg & Schippers, 2007). In recent years, increased competition has engendered the

need for better products, impelling organizations to rely more and more on informationally diverse teams (Devine et al., 1999). Researchers, however, have suggested that the extent to which informational diversity is translated into performance gains lies in the way that team members communicate with one another (van Knippenberg et al., 2004). Informationally diverse teams only capitalize on the larger breadth of available knowledge when team members make the effort to exchange information and synthesize each other's ideas. Elaboration is thought to be beneficial because it is the deeper consideration and synthesis of perspectives that mobilize the cognitive resources of team members. Informationally diverse teams who do not make the effort to do this may not arrive at any better solutions than their homogeneous counterpart. Because of the heightened importance of elaboration in functionally diverse teams, in the first 2 chapters of my dissertation I examine elaboration in contexts that speak directly to such teams.

In the 1st chapter of my dissertation, I examine the role that emotional intelligence (EI) defined as the "ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and action" (Salovey & Mayer, 1990, pp. 189) in affecting elaboration and performance in two contexts: informationally homogeneous and diverse settings. In the 2nd chapter of my dissertation, I introduce the concept of representational gaps—fundamental incompatibilities in team members' definition of the problem and solution space (Cronin & Weingart, 2007)—and devise a new method for measuring them. I then theorize about how they may degrade elaboration and in turn performance. I propose that because representational gaps are more likely to be embedded in informationally diverse teams (Dougherty, 1992), they can pose a double threat to such informationally diverse teams by degrading the processes (e.g. elaboration) that such teams need most. In the 3rd chapter of my dissertation I take a longitudinal lens and explore the outcomes of

elaboration. Specifically, I examine how elaborating early on affects team performance over time.

Literature Review

Theoretical Roots of Information Elaboration and Motivation for Current Research

The concept of information elaboration has its roots in demographic diversity research (e.g. Pelled, Eishenhardt, & Xin, 1999; Lawrence, 1997). The rise of this area is linked to not only the growing presence of women and minorities in the work force (Buhler, 1997) but also to the increasing complexity of tasks that require collaboration among employees of multiple functional areas (Dean & Snell, 1991). The crux of early models centered on the role of conflict in decision making (e.g., Amason, 1996; Amason & Schweiger, 1994; Jehn, 1995; Jehn, 1997). Generally speaking, early models proposed that task conflict would improve decision making by increasing the depth and criticality with which information would be considered (Jehn, 1995, Shculz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006). Furthermore, it was proposed that functional diversity would engender task conflict as team members would be more likely to view the task through different lenses that would ultimately need resolving and spur these positive byproducts (Jehn, Northcraft, & Neale, 1999; Pelled et al., 1999).

While this line of inquiry has proliferated a robust stream of empirical research (see van Knippenberg & Schippers, 2007; de Wit, Greer, & Jehn, 2013), meta-analytical results has not always found a clear link between functional diversity and performance (see Webber & Donohue, 2001). A proposed reason for these results is that the theoretical mechanism through which functional diversity is purported to function—task conflict—lacks specification (van Knippenberg et al., 2004). Conceptually, it is not conflict per se that is thought to give rise to the beneficial effects of diversity—it is the way that those differences are reconciled that is supposed

to bring about greater understanding of the task (Kuhn & Poole, 2000). A number of researchers in the conflict management stream have noted the importance of considering resolution styles in affecting performance, in the presence of conflict (Jordan & Troth, 2004; Tjosvold, 1991; Tjosvold, 2008). Although several schemes exist, an intuitive and accepted way of classifying resolution styles is using the tripartite taxonomy of avoidance, competing, and cooperative (Deutsch, 1973). Avoidance communicates that issues should not be openly discussed and resolved, competing involves perceiving conflict as a win-lose and attempting to win through force and asserting one's side, and cooperation involves finding a solution that is mutually beneficial. The goal of creating a mutually beneficial solution leads to tactics such as exploring underlying issues and assumptions, exchanging information, and open-minded discussions. Researchers have noted that what translates diversity to better solutions is this cooperative approach to conflict resolution—the deep elaboration of task relevant information—and not the mere existence of conflict as conflict can be dealt with through avoidance or dominating approaches (Lovelace, Shapiro, & Weingart, 2001).

In addition, successful conflict resolution and the high-level communication that is required for it to take place, is more or less likely under a host of moderators. A few such variables include psychological safety (Edmondson & Zhike, 2014), trust (Simons & Peterson, 2000), and the level of relationship conflict that co-occurs with task conflict (de Wit, Jehn, & Scheepers, 2013). In fact, researchers have denoted entire "contingency models" specifying the conditions under which task conflict leads to better or worse performance (de Dreu & Weingart, 2003; Jehn & Bendersky, 2003).

What this trend points to is that task conflict is not a fully sufficient model when it comes to tapping into the mechanism of what translates diversity into better performance. Conflict

might be a catalyst for the deeper consideration of the task and for more thorough information exchange and processing, but it is the *act of elaborating* that brings about better performance. For this reason, my dissertation focuses on information elaboration. While this previous conversation has focused on diverse teams, in reality knowledge teams always perform tasks that are "fuzzy" (Campbell, 1988) and require elaboration to complete well. Fuzzy tasks are complex and have multiple paths to accomplishment as well as multiple goals that need balancing. To succeed, knowledge teams need to navigate these complexities well and thus need to process information deeply (Gardner, Gino, & Staats, 2012) regardless of the diversity level. That is, even if teams do have overlapping knowledge, the necessity of elaboration still stands as the optimal choice is not obvious, and teams need to delve into the pros and cons of different options to perform well. While it is true that in theory a fully homogeneous team can individually arrive at an optimal solution as each member contains what is necessary to process the task (Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). In reality, complex tasks have an almost infinite number of possible paths (e.g. designing a website, creating a policy, developing a new product) and therefore even homogeneous teams need to elaborate to arrive at a shared understanding of what the work entails (Ericksen & Dyer, 2004; Woolley, 2009)

Parallel to this research stream is work on hidden profiles in the communication field (see Wittenbaum, Hollingshead, & Botero, 2004). A hidden profile is an experimental condition in which team members are given a task to solve (e.g. who is the murder, best candidate to hire) and the information is distributed in such a way that the correct answer is only discoverable if team members pool their information together. This type of task is used to study information-sharing processes in decision making teams. A seminal study by Stasser and Titus (1985) found that the majority of teams failed to solve a hidden profile. Research has henceforth moved

towards understanding the conditions under which teams are likely to share and use each other's unique information.

Antecedents of Elaboration

Prediscussion disagreement. Although task conflict lacks specification in terms of predicting the effects of team performance (diverse and non-diverse teams performing complex tasks), a widely assumed antecedent to elaboration is task conflict. Task conflict is thought to force members to defend their points of view and engage in a deeper search and exchange of information. Schulz-Hardt and colleagues (2006) found that prediscussion disagreement improved the solving rate of hidden profile tasks and that this effect was due to teams' increased discussion intensity and decreased discussion bias. Disagreement also increased the number of unshared information discussed (Hightower & Sayeed, 1996) and facilitates fast and thorough information exchange (Parks & Nelson, 1999).

Norms and Climate. Norms are the taken-for-granted beliefs that define appropriate attitudes and behaviors for organizational employees (O'Reilly & Chatman, 1996). Postmes, Spears and Cihangir (2001) found that norms that emphasize critical evaluation improved the solving rate of hidden profile tasks compared to norms of consensus and that this was mediated by the positive value placed on unshared information. In one of the few studies on employee voice in a team setting, Morrison, Wheeler-Smith, and Kamdar (2011) found that voice climate—shared beliefs about the safety and efficacy of speaking up—predicted individual voicing in teams.

Expectations. Research has also focused on the role of expectation of having unique information as an antecedent to elaboration. For instance Phillips, Mannix, Neale and Gruenfeld (2004) found that teams who were congruent in their social and knowledge ties (when friends

possess the same information and strangers possess different information) outperformed incongruent teams (when friends possess different information and certain members of the friend group possess the same information as the stranger). Incongruent teams essentially had violated expectations when unique information came from the friend as opposed to the stranger. Congruent teams on the other hand had information distributed in a way that was in sync with expectations. The authors found that congruent teams used information more effectively and solved the hidden profile more often. Another study used surface-level diversity as a proxy for expectations of divergent viewpoint (Phillips & Loyd, 2006). In this study, the authors found that in surface-level diverse teams (e.g. two business students and one medical student), team members had higher expectation of unique information and viewpoints, and thus were more likely to voice their own unique perspective and that the team as a whole displayed greater task engagement than in surface-level homogeneous group (e.g. all business students).

Individual differences. A related research stream investigates individual differences in team members that might precipitate elaboration. Kearney, Gebert and Voelpel (2009) found that need for cognition—the tendency to engage in and enjoy effortful cognitive endeavors—improved performance in diverse teams through its effects on elaboration. The authors proposed that need for cognition reflects an individual's intrinsic motivation to process information carefully and that elaboration translated into better performance in diverse teams. Homan et al (2008) found similar results in teams that were high on openness to experience. Openness to experience is one of the big five personality factors and refers to an individual's willingness to explore, tolerate, and consider new and unfamiliar ideas and experiences (McCrae & Costa, 1987). The 1st chapter of my dissertation examines emotional intelligence as an enabling

antecedent to elaboration and the 2nd chapter of my dissertation examines representational gaps as a detractor to elaboration.

Outcomes of Elaboration

It is well accepted that information elaboration is a cornerstone of effective team functioning. Elaborating means that information and perspectives are carefully considered and that time is spent weighing the pros and cons of different options (van Knippenberg et al., 2004). Researchers have long noted the importance of effective communication (e.g. Hackman & Oldham, 1976), especially in teams that perform non-routine and intellective tasks (Jehn, 1995; Pelled, Eisenhardt, & Xin, 1999).

Although much is known about how elaboration impacts performance at any one point in time, less is known about how they impact performance over time. The dynamic criteria literature (Hofmann, Jacobs, & Baratta, 1993; Landis, 2001) suggests that rates of change—or performance trajectories—can vary between teams and that examining the factors that give rise to this variance has implications for the overall effectiveness of teams. Although scholars have advocated for the need to conceptualize teams as dynamic (Cronin, Weingart, & Todorova, 2011) and examine their performance over time instead of as a snapshot in time, few team studies have included longitudinal criterion measures and none to my knowledge have incorporated elaboration as the independent variable that predicts these criterion outcomes. The 3rd chapter of my dissertation examines how elaborating early on impacts teams' performance trajectories and end state performance.

Although generally speaking, elaboration improves performance, and the 2nd chapter of my dissertation proposes a main effect between elaboration and performance, the 1st chapter of my dissertation considers a moderator to this relationship—informational diversity. I propose

that the extent to which elaboration is translated into performance gains will depend on the way that information is distributed in teams; and that specifically, elaboration will increase performance in informationally diverse but not homogeneous teams. This argument takes the perspective that not all elaboration is created equally. I present the theoretical basis for this argument in Chapter 1.

Chapter 1: Emotional Intelligence, Elaboration, and Informational Diversity

Theory

When managers started to learn about the concept of emotional intelligence, it quickly evolved into a hot topic (Goleman, 1998). The idea that emotional competencies could predict work outcomes above and beyond more traditional measures—task expertise, skills, and general intelligence—resonated in a workplace that is increasingly multidisciplinary and boundary spanning. Modern work demands require that individuals not only possess the ability to complete tasks on their own but also to pool knowledge and skills collaboratively with others (Jackson, Joshi, & Erhardt, 2003). Facility in navigating interpersonal relationships is therefore becoming more central for a productive workplace. It is through this mechanism that EI is thought to predict performance. And for this reason researchers have sometimes purposefully chosen settings that might require a high degree of social ability, studying police officers (Daus & Brown, 2012), debt collectors (Bachman, Stein, Campbell & Sitarenios, 2000) and nurses (Quoidbach & Hansenne, 2009). In fact, Farh, Seo and Tesluk (2012) found that it is in jobs that require interpersonal interactions that EI's relationship with individual performance is strongest.

Although theoretical models of EI point to its benefits being mainly activated through interpersonal mechanisms (Farh et al., 2012; Salovey & Mayer, 1990), there are no studies of how EI may influence the ability of team members to communicate deeply, or elaborate, with each other. Given that teamwork and communication often relies on the skills that are purported to be contained in emotionally intelligent members (Woolley, Chabris, Pentland, Hasmi, Malone, 2010), EI may be a key predictor of information elaboration.

Furthermore, I examine a boundary condition around the effects of EI on performance: informational diversity. Considering that informationally diverse teams are both common and hold the potential to outperform their homogeneous counterpart (Kim, Barnato, Augus, Fleisher, & Kahn, 2010), the current study explores whether EI might be more beneficial in such a setting. Specifically, I propose that EI should increase elaboration in all conditions but that informational diversity will moderate the relationship between elaboration and performance such that it is only significant in informationally diverse teams. This reasoning emphasizes the perspective that all decision making teams need to elaborate. It is not only unlikely that all members occupy the exact same thought world (Klimoski & Mohammed, 1994), but even in the most homogeneous situation, members will have to coordinate and come to a consensus. EI is therefore a variable that is relevant to elaboration in all team settings because there is rarely a truly "homogeneous" situation and considers informational diversity an enabling factor that translates elaboration into better performance. I present my model in Figure 1

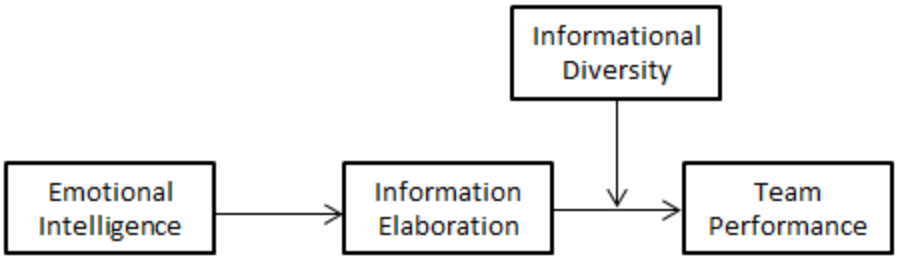

Figure 1 Theoretical Model Depicting the Proposed Moderated Mediation

Defining Individual and Team EI

I focus on Mayer and Salovey's (1997) ability-based model of EI instead of others, such as mixed-models (Bar-On, 1997; Tett, Fox, & Wang, 2005), which combine ability with social skills. The Bar-On is a well-known EI scale that belongs to this category and includes, among other things, ability, personality, social responsibility, and optimism (Bar-On, 1997). I focus on a strictly ability-based measure of EI because to fulfill the conceptual criterion of EI as an intelligence, one must measure ability and not a preferred way of behaving or personality tendencies (Law, Wong, & Song, 2004). Mayer and Salovey (1997) conceived of EI as a four pronged construct. The first factor (*perceiving branch*) is the ability to perceive emotions accurately—that is, to identify emotional states, thoughts, and feelings in oneself and others. The second factor (*using branch)* is the capacity to access and generate feelings to facilitate thought. The third factor (*understanding branch)* refers to the ability to discern between nuanced emotional states, understand emotional language and the signals conveyed by emotions. The last factor (*managing branch*) is the ability to regulate emotions and entails a willingness to stay open to experiencing both pleasant and unpleasant feelings. Together, these EI branches

represent a construct that refers to an individual's heightened ability to use emotions in intra- and interpersonal contexts.

Aggregating it to the team level, prior research has conceived of team EI in two main ways. One stream regards team EI as an emergent state; specifically, it is seen as a climate that influences team members' interpretation of and responses to emotional issues (Ayoko, Callan, & Hartel, 2008). Conversely, others have conceived of team EI as a resource that individuals bring to their team for task accomplishment (e.g., Chang, Sy, & Choi, 2012; Jordan & Troth, 2004, Quoidbach & Hansenne, 2009; Troth et al., 2012). In the current study I adopt this latter perspective and interpret EI as an individual trait that acts as an input to team processes and outcomes. Researchers have suggested that the appropriate aggregation of individual traits to team-level composites should depend on the task being performed (Barrick, Stewart, Neubert, & Mount, 1998; Steiner, 1972).

I operationalize team EI as the average of team members' EI. The current task was a complex decision making exercise (McGrath, 1984) in which teams had to carefully consider multiple possibilities to arrive at the optimal solution. Each team member had equal responsibility to take part in the discussion and had an equal amount of information about the task and doing well required that teammates work interdependently. Under this scenario, the mean may be the most appropriate operationalization because each member's EI is added to the collective potential that could be used towards task accomplishment (Cote 2007; Elfenbein 2006). No member had more status or information than any other. Furthermore, researchers have found that average trait levels are a robust predictor of team outcomes (Barrick et al., 1998; Bell, 2007) perhaps because averages are the single best representation of a distribution (Bell, 2007).

Lastly, because EI is multidimensional, there are multiple ways to summarize its dimensions. Law, Wong, and Mobley (1998) have suggested that when a construct exists at a deeper level than its facets, the most appropriate aggregation is a single latent multidimensional variable. Since the branches of EI are interrelated and cascading (Joseph & Newman, 2010), abstracting an individual's EI "profile" by considering all the branch scores is most in line with the theory (Wong & Law, 2002). For instance, an individual can be high on managing emotions but low on perceiving them, creating a situation whereby this person is managing his or her emotions inappropriately (e.g., managing them unnecessarily, managing the wrong emotions or at the wrong time). For this reason, I consider the *combination* of emotional abilities as the main predictor.

Team EI and Elaboration

I propose that team EI improves elaboration because of the increased ability of high EI members to perceive others' and manage one's own emotions during team discussions. Information elaboration can be cognitively taxing as team members must expand effort to try to understand each other's perspectives, synthesize that with one's own, and feed new knowledge back to the team. Several reasons support the possibility that team EI may facilitate elaboration. Firstly, emotional expressions contain information (Keltner & Haidt, 2001) and the accurate reading of it may propagate more in-sync communication. The social functional theory of emotions suggest that emotions serve functions, that is, they "do work" to enable coordinated interactions (Keltner & Haidt, 2001). Interpersonal problems provoke specific emotions and the physical manifestation (e.g., facial, voice, posture, gestures) of these emotions trigger behavior in the counterpart to resolve the originating problem (Kelter & Buswell, 1997; Morris & Keltner, 2000). Because individuals who are high on EI are better at accurately perceiving others'

emotions, they can more easily infer information about their teammates' attitudes, goals, and behavioral intentions (see van Kleef & Gerben, 2009). These insights are task relevant and can help put the communicated information in context and thus allow for more effective responses. For instance, if a piece of information seems misaligned with the communicator's persona, goals, or interests, high EI teams may be more likely to pick up on it and ask the communicator to elaborate. Alternatively, hesitance by one teammate may be recognized by others and lead to behavior that elicits sharing (e.g. warmth, openness). These actions in turn propagate the high level communication loop that is necessary during elaboration by more tightly linking intentions to responses.

Secondly, team EI may improve elaboration by making it more likely that high EI teams are able to synthesize ideas collaboratively. Collaboration relies on being able to deal with the rights and opinions of others (Canary & Cupach, 1988), and requires a high degree of openness Jordan & Troth, 2004). Emotional management is related to being open to experiencing a range of emotions—both pleasant and unpleasant ones (Butler, Egloff, Wihelm, Smith, Erickson, & Gross, 2003). Staying open to feelings is important during elaboration because it aids in keeping the high-quality feedback loop in motion. Being comfortable feeling positive and negative emotions ensures that teammates will listen to each other, even when those opinions are different from one's own. Team EI may thus allow members to be more inclined to listen to alternative viewpoints and look for superior solutions without disengaging or feeling threatened (Jordan & Troth, 2004; Yang & Mossholder, 2004). Listening and responding effectively is in turn crucial to staying engaged during communication and keeping it a collaborative process.

A third way that team EI can enhance elaboration is through its effects on cognition. Emotions facilitate thought because feelings can be used as additional information (Mayer &

Salovey, 1997). Emotionally intelligent individuals may thus find it easier to process large amounts of information and prioritize thinking because of increased capacity to use cues from one's affective reactions to focus on what is important (Lerner & Keltner, 2001). Individual processing capabilities are valuable during elaboration because this allows additional resources to be devoted to thinking about how to present an idea in the most influential manner. More cognitive space can mean having room to shape one's verbal argument in a clear and concise manner that will make it easier for others to understand and respond to.

In sum, team EI may represent a variable that increases elaboration through inter— and intrapersonal mechanisms. Teams with higher EI may have a heightened ability to read others' emotional cues and respond more effectively, be able to deal with the emotionality of intensive discussions, and have increase capacity for individual information processing. These mechanisms in turn relate to elaboration by making it easier to stay engaged and build on one another's arguments. In line with these illustrations, research in negotiation has shown that EI can lead to awareness about the other party's interests and better communication processes that create a larger pie for everyone (Foo, Elfenbein, Tan, & Aik, 2004). Similarly, Wolff, Pescosolido and Druskat (2002) found that emotional perceptiveness increased efforts to coordinate and elaborate on the team task. In light of this evidence, I propose that:

Ch1, H1: Team EI positively predicts information elaboration

The Moderating Role of Informational Diversity

Informational diversity may moderate the relationship between elaboration and performance for two main reasons. The first is that elaborating in informationally diverse teams means that team members are more likely to be exchanging unique information (Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007). In this condition teammates may not have other

avenues for gaining that piece of task relevant information and simply exchanging it may improve performance. Relatedly, to the extent that informational diversity is correlated with team members having different ideas about how to approach the task (Allen & Cohen, 1969; Dougherty, 1992), engaging in this higher order listening-processing-and-responding loop should lead to better performance. For instance, spending the time to explain the context in which one's information is imbedded in (Bechky, 2003) should significantly improve decision quality. On the other hand, when homogeneous teams engage in in-depth elaboration, the discussion is more likely to center on knowledge and perspectives that each individual already held (Stasser & Titus, 1985) and thus may not impact performance as much.

The second reason I posit elaboration to be significantly related to performance in informationally diverse teams involves the effect of diversity on discussion bias. In the process of discussing the task, diverse teams are more likely to unearth conflicting ideas and have different opinions about how to move forward (Jehn, Northcraft, & Neale, 1999). As we know from research on dissent, elaboration in the presence of disagreement often leads to higher performance payoffs relative to when team members have consensual views (Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006). When team members all agree on the same course of action, shared information and preference-consistent perspectives are introduced and repeated more often (Dennis, 1996; Schulz-Hardt et al., 2006). Being exposed to a different point of view, however, can instigate vigilant analysis of all information and perspectives—including unshared and preference-inconsistent ones (Nemeth, 1986). The lack of dissent in homogeneous teams, however, may not increase the push to more accurate and less biased discussions (Schulz-Hardt et al., 2006). Therefore, the *quality* of elaboration should be higher in informationally diverse teams, leading it to relate significantly to performance.

The positive effects of informational diversity and elaboration are likely to be strongest on tasks that are non-routine and have strong information processing requirements (van Dijk, van Engen, & van Knippenberg, 2012). Such tasks are ambiguous in nature and have many possible paths to completion (van de Ven, Delbecq, and Koenig, 1976). Engaging in elaboration and having diverse sets of knowledge and perspectives to draw from thus becomes central. For this reason I tested my hypotheses in a complex decision making context.

What this implies, in addition, is that the effects of elaboration on performance, although weaker in the non-diverse condition should still be positive and significant. Like I have mentioned previously, knowledge based teams that engage in complex tasks must discuss how to accomplish the task as the optimal choice is not obvious (Campbell, 1988; Gardner, Gino, & Staats, 2012). Therefore, non-diverse teams that elaborate should develop a deeper understanding of the task and arrive at a better solution, although the relationship between elaboration and performance should be less steep.

Ch1, H2: Informational diversity and elaboration interact such that elaboration is more positively associated with performance in the informationally diverse condition.

By extension, the full model depicted by Figure 1 and hypotheses 1 and 2 suggest a second stage moderated mediation. The proposed relationships, taken together, imply that elaboration should have a lager conditional indirect effect (be a stronger mediator) between team EI and performance in the informationally diverse, but not the homogeneous condition. The indirect effect of team EI on performance through elaboration is conditional on the diversity condition. I therefore propose that:

Ch1, H3: Informational diversity moderates the positive and indirect effect of team EI on performance (through elaboration). Specifically, elaboration will exhibit a larger indirect effect between team EI and performance in the informationally diverse condition.

Methods

Sample and Procedure

A total of 141 students from a large East Coast University participated in the experiment in exchange for course credit or cash ($10). The three teams that performed best were awarded an additional $60 per team. Upon arrival to the laboratory, participants were randomly assigned to groups of 3, and the groups were then randomly assigned to either the informationally diverse or homogeneous condition. The mean age of the participants was 21 years and 89 of them were women (63%). A total of 47 groups participated.

Prior to coming to the laboratory, participants were sent a link to complete the EI and cognitive intelligence test on their own. Because the EI test was fairly long (approximately 30 minutes), this was done to ensure that participants did not suffer from test taking fatigue. Upon arrival, participants were led to their individual computers and asked to complete a pre-task questionnaire. After all participants completed the questionnaire they were ushered into another room and presented with the task. At this point, they were asked for consent to be videotaped and all teams agreed. They were given 25 minutes to complete the task.

The Task

The task was a decision making task that required groups to rank order items (e.g., supplies) in order of importance in a survival situation. The materials for the task described a situation in which a plane had crashed under bad weather and included details about the length

that the storm was expected to last, the terrain surrounding the crash site, and the condition of the plane and pilot. Team members were given a list of items and asked to rank them from most valuable to have in this scenario to least. This type of task has been used extensively in prior research on groups (e.g., Homan et al., 2007; Jordan & Troth, 2004). To complete the task, participants were given a rich scenario with many details about their current survival situation. Teams were asked to imagine that their current members and themselves are the ones in the situation. Careful consideration of the presented material gave participants context that was useful in ordering the survival items. A total of twelve items were presented for ordering.

Manipulation of Informational Diversity

The task was developed by a leadership group in conjunction with a team of mountain rescuers and survival educators. In the user manual that accompanied the task, these outdoor professionals explained their rationale for ordering items in a specific way. Based on this document, I identified 6 additional pieces of information that were useful in deciding how to rank the items. These 6 pieces of information each pertained to one of the items that team members were asked to rank**.** I used standard procedures to manipulate the informationally diverse versus homogeneous conditions (e.g., Gruenfeld, Mannix, Williams, & Neale, 1996; Stasser & Titus, 1985). In the informationally diverse condition, all team members received the same contextual information with task relevant clues and 2 of the 6 additional pieces of information. Therefore, in the aggregate, the team had all the additional task relevant information. In the informationally homogeneous condition, all team members were given these 6 pieces of information in addition to the task relevant contextual information. In both conditions, team members had to work interdependently with one another to discuss how to rank the items. Therefore, even though in the homogeneous condition everyone had the same

information, a high elaboration score was still possible because there was enough richness in the scenario and ambiguity in the rankings to have an in-depth discussion.

Measures

Emotional Intelligence. EI was measured by using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002), a 141 item ability test of emotional intelligence. The MSCEIT has shown a number of psychometric properties, including high test-retest correlation (Brackett & Mayer, 2003), high internal reliability (Brackett & Mayer, 2003; Mayer, Salovey, Caruso, & Sitarenios, 2003), discriminate validity from personality (Bracket, & Mayer, 2003), and criterion validity in predicting outcomes (Lopes et al., 2006). The test consists of four parts, each corresponding to a branch of the multidimensional construct of emotional intelligence. The test asks respondents to identify emotions in faces and landscapes, indicate how emotions influence thinking and reasoning, decompose complex feelings into separate emotions, and rate the effectiveness of different emotional regulation strategies in multiple contexts. The MSCEIT is scored by an independent publisher using a copyrighted system. Respondents garner points to the extent that their answers match a large normative sample of people from multiple countries.

Lastly, because EI is multidimensional, there are multiple ways to summarize its dimensions. Law, Wong, and Mobley (1998) have suggested that when a construct exists at a deeper level than its facets, the most appropriate aggregation is a single latent multidimensional variable. Since the branches of EI are interrelated and cascading (Joseph & Newman, 2010), abstracting an individual's EI "profile" by considering all the branch scores is most in line with the theory (Wong & Law, 2002). For instance, an individual can be high on managing emotions

but low on perceiving them, creating a situation whereby this person is managing his or her emotions inappropriately (e.g., managing them unnecessarily, managing the wrong emotions or at the wrong time). For this reason, I consider the *combination* of emotional abilities as the main predictor.

Performance. Performance was measured as the difference between teams' ranking of the items and the outdoor professionals' rankings (see section on manipulation of informational diversity). These professionals used the information from the scenario that was given to participants to gauge the relative importance of each item (e.g., snow is deep so snowshoes are important to stay afloat). Expert rankings therefore represented a relatively objective measure of the importance of each survival item. Because lower scores reflected better performance, this measure was reversed for easier interpretation.

Information elaboration. Information elaboration was rated by coding the videotapes of team interaction. The difference between the homogeneous and diverse conditions was in the distribution of the 6 pieces of additional information. Since each piece of information corresponded to an item to be ranked, differences in group information elaboration should mainly emerge in the discussion of how to rank those specific items.[1] Accordingly, the information elaboration measure was coded for these 6 items (Homan et al., 2007).

[1] Homan et al., (2007) used a similar coding scheme for information elaboration and used a similar experimental task. The methods section reported by the authors used the elaboration score of the subset of information that was distributed differently between the two conditions (same as in the present paper). However, for completeness sake, the authors coded all pieces of information and compared the elaboration of information that was given to all members in both conditions and those pieces of information that were distributed in a hidden profile manner in one condition and homogeneous manner in another. The authors found that it was only for information that was distributed differentially in the two conditions that elaboration scores differed. Information that was distributed to all members of both conditions exhibited similar

To create the coding scheme, I followed previous researchers (e.g., Hoever, van Knippenberg, van Ginkel & Barkema, 2012; Homan et al., 2007; van Ginkel & van Knippenberg, 2008) and adapted it to the current task. Two raters, blind to the condition, coded the videos for information elaboration. They double coded 20% of the videos to assess the extent to which these coders were consistent. The coders had high agreement and reliability (ICC(1) = .76 ICC(2) = .87), supporting aggregation of the data. An elaboration score was given for each of the 6 items, and was anchored on a 1 to 7 scale, with higher numbers representing more elaboration. The maximum number of points that each team could receive was thus 6 items times 7 points for a total 42 points. The detailed coding scheme is in Appendix A.

Manipulation Check. In line with prior research (Homan et al., 2007; Phillips et al., 2004), the manipulation check assessed the extent to which team members realized that other members had different information. Two coders, blind to the conditions and hypotheses counted the number of times team members commented on the existence of different information. To assess the extent to which these coders were consistent, 17% of the videos were double coded. The coders had reasonable agreement and reliability (ICC(1) = 0.7 ICC(2) = .82), supporting aggregating the data.

Controls. I controlled for the Big Five personality traits and cognitive intelligence because these variables may act as confounds in the relationship between EI and team performance. A review of the literature revealed that the personality composition and general cognitive ability of teams can affect team performance either directly or through team emergent states (Barrick et al., 1998). The Big Five traits are conceptually related to the emotion system

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elaboration scores. Using this rationale, I also only coded the subset of information that was distributed differentially in the two conditions. I expected any variance of elaboration in predicting performance to emerge from those pieces of information.

(Izard, 2001) and can display up to moderate correlations with EI (Day & Carroll, 2004; Law, Wong & Song, 2004). Cognitive intelligence can also overlap with EI as both are conceptualized as ability-based variables (Mayer, Salovey & Caruso, 2004). In light of these arguments, I controlled for the Big Five and cognitive ability to ascertain that any effects found between EI and team outcomes are not spurious. I measured the Big Five using the 20-item version of the International Personality Item Pool (Cooper, Smillie & Corr, 2010) and Cognitive Intelligence by administering the Wonderlic Personnel Test, a 50-question 12-minute test with high validity (Wonderlic, 2002) and common usage in past research (e.g., Cote, Lopes, Salovey, & Miners, 2010). The personality measures showed adequate internal consistency (agreeableness $\alpha = .81$; conscientiousness $\alpha = .70$; extraversion $\alpha = .83$; openness $\alpha = .67$; neuroticism $\alpha = .75$).

Scholars have argued that social categorization can occur when team members are dissimilar to one another (Williams & O'Reilly, 1998) and that these influences can affect the extent to which teammates are willing to share information (van Knippenberg et al., 2004). Demographic variables are a salient basis for making us-versus-them distinctions, especially when teams are newly formed (Jehn, 1995; Jehn et al., 1999). I therefore controlled for diversity in age, ethnicity, and gender to account for any effect they may have on elaboration and performance. I operationalized ethnic and gender diversity using Blau's index (Harrison & Klein, 2007) and age diversity using the coefficient of variation.

Results

Means, standard deviations, and correlation coefficient for all measures at the team level are reported in Table 1. Because I make predictions that include interactions, I mean center all variables to aid interpretation of main effects.

Table 1 Descriptive Statistics

Variable	M	SD	1	2	3	4	5
1. Overall Emotional Intelligence	95.90	8.32					
2. Information Elaboration	5.07	1.21	0.40				
3. Performance	21.89	6.58	0.01	0.20			
4. Diversity	0.51	0.51	0.18	0.39	0.19		
5. Conscientiousness	3.68	0.42	0.23	0.33	-0.09	0.31	
6. Agreeableness	3.91	0.40	0.10	-0.04	-0.38	0.11	0.16

Note. N = 47. Diversity is dummy coded: 1 = heterogeneous, 0 = homogeneous. Correlations > .28 are significant at .05

Preliminary Analysis

Control Variables. Becker (2005) has argued that control variables are sometimes included without statistical justification (e.g. they are not correlated with the dependent variable) and that doing so biases the parameter estimates because they consume degrees of freedom. I therefore examined the correlation between all control variables and elaboration and performance. Average member conscientiousness was positively related to elaboration ($r = .33$; $p = .02$) and average member agreeableness ($r = -.38$; $p = .01$) was negatively related to team performance. I therefore include average member conscientiousness and agreeableness in all subsequent analysis. The other control variables were not significantly related to elaboration or performance, nor did they interact with condition to predict the dependent variables.

Manipulation Check. Teams in the informationally diverse condition commented more often on the fact that team members had different information ($M = 5.6$, $SD = 4.85$) than the homogeneous condition ($M = .47$, $SD = 1.04$), $F(1, 45) = 24.57$, $p = .01$.These results suggest a successful manipulation of informational diversity.

Hypotheses Testing

Table 2 presents the regression results for the hypotheses. Hypothesis 1 predicted that average member EI would increase information elaboration. Regression results show that EI did increase elaboration ($\beta = .05$, $p = .02$), even after holding constant average member agreeableness and conscientiousness. To make sure that it was appropriate to combine the conditions, I regressed the interaction of EI and condition and found it to be insignificant ($\beta = .05$, $p = .30$, ns) in predicting elaboration. I therefore included diversity as a covariate, but did not perform separate analyses for each condition. These results support hypothesis 1.

Table 2. Results of Regression Analysis

	Hypothesis 1		Hypothesis 2		
Predictor	Elaboration		Performance		
Controls					
Agreeableness	-0.36	-0.41	-6.53*	-6.24*	-4.38
Conscientiousness	0.71	0.55	-1.59	-2.16	-3.12
Diverse Condition	0.77*	0.68*	3.40	2.79	2.86
Main Effects					
EI		.05*			
Elab				0.80	-1.19
Interaction					
Elab * Diversity					4.12**
R-squared	0.21	0.31	0.21	0.23	0.33
Change R-squared		.10*		0.02	.10*

Note. N = 47. Diversity is dummy coded: 1 = heterogeneous, 0 = homogeneous. Agreeableness, Conscientiousness, EI, and Elaboration are mean centered

Hypothesis 2 predicted that the relationship between elaboration and performance would be more pronounced in the informationally diverse condition. Regression results show that the cross product between elaboration and informational diversity was indeed significant ($\beta = 4.12$, $p = .01$). Following Aiken and West (1991), I further probed this interaction. Elaboration significantly predicted performance in the informationally diverse ($\beta = 3.40$, $p = .003$) but not in the homogeneous condition ($\beta = -1.04$, $p = .42$, ns). These results partially support hypothesis 2. Figure 2 provides a graphical representation of the interaction.

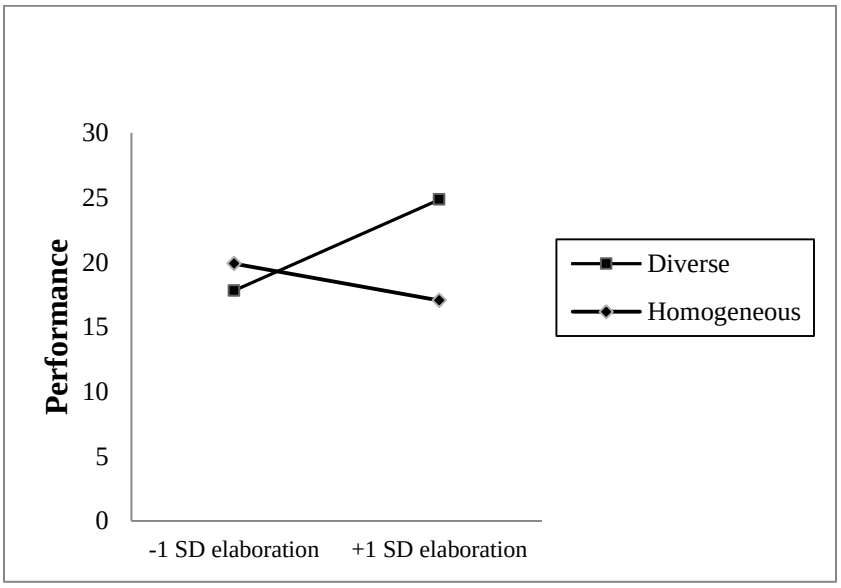

Figure 2 Interaction of elaboration and diversity on performance

To test the whole model, hypothesis 3 involved a second stage moderated mediation. A moderated mediation implies that the mediating effect of average member EI on performance through elaboration is moderated by the diversity condition. Specifically, I posited that this indirect effect will be larger in the informationally diverse condition. To test hypothesis 3 I used the methods laid out by Edwards and Lambert (2007). The specified model conceptually follows their Panel C (Edwards & Lambert, 2007 pp. 4). I examined the conditional indirect effect of

average member EI on performance (through elaboration) in the informationally diverse and homogeneous conditions. To test the significance of the conditional indirect effects I used 95% bias-corrected confidence estimates based on bootstrapping as opposed to normal-theory tests (e.g. Sobel) because the sampling distribution of the conditional indirect effect tends to be irregularly shaped (Preacher, Rucker, & Hayes, 2007). The indirect effect is significant if the 95% confidence interval does not include zero. The results are listed in Table 3 and show that the indirect effect of EI on performance through information elaboration was significant in the informationally diverse (point estimate = .15, 95% CI [.03 .37]) but not in the homogeneous condition (point estimate = -.06, 95% CI [-.21 .06]). These results support hypothesis 3.

Table 3. Results of Bias Corrected Bootstrapping

	Indirect Effect	SE	LLCI	ULCI
Condition				
Informationally diverse	0.15	0.08	0.03	0.37
Informationally homogeneous	-0.06	0.06	-0.21	0.06
	Direct Effect			
	-0.01	0.11	-0.24	0.21

Note. N = 47. LLCI denotes "Lower level confidence interval" and ULCI denotes "Upper level confidence interval." These confidence intervals are of the 95th percentile

Auxiliary Analysis

I proposed that a central mechanism driving the EI to elaboration link was the increased ability of high EI teams to read each other's emotions. Post hoc analysis found a significant relationship between the perceiving branch of EI and elaboration ($\beta = .04$, $p = .03$) after holding

constant the other branches of EI, agreeableness and conscientiousness. However, perceiving was not predictive of the model as a whole (e.g., the moderated mediation). The present study also posited that for theoretical (Cote, 2007; Elfenbein, 2006; McGrath, 1984) and empirical reasons (Barrick et al., 1998, Bell, 2007) average member EI should be a strong predictor of team outcomes. Post hoc analysis found that neither a team's maximum EI nor its standard deviation significantly predicted any of the hypothesized relationships. However, a team's minimum did predict the full model—that is, the second stage moderated mediation depicted by Figure 1 (conditional indirect effect in the informationally diverse condition: point estimate = .12, 95% CI [.01 .33]; conditional indirect effect in the homogeneous condition: point estimate = -.07, CI [.-.26 .08]). I discuss the implication of these findings in the discussion section below.

Discussion

The present paper argued and found that average member EI increased elaboration which in turn led to better performance in the informationally diverse condition. Informational diversity therefore acted as a boundary condition around the usefulness of EI. I reasoned that EI's influence on elaboration was driven by the greater inter—and intrapersonal facility exhibited by emotionally intelligent teams. Furthermore, I posited that elaboration was translated into better performance in informationally diverse teams because of diminished discussion bias. The results held after controlling for average member conscientiousness and agreeableness.

Implications

Theoretical Implications

Overall, the current findings point to the importance of studying EI in a team setting, especially because the proposed mechanisms through which EI works are interpersonal (Jordan & Troth, 2004). EI is thought to lubricate the social fabric that permeates daily interactions,

which is why it is predictive in work contexts with high relational demands (Farh et al., 2012). The present study builds on this logic and adds to research that has also considered the role of EI in interpersonal contexts, such as leadership (Cote et al., 2010) and negotiation (Foo et al., 2004). However, it also stands apart from previous work in that it considers the team as the unit of analysis. Team interactions may function very differently from equal status dyads or leader-subordinate interactions, and the role that EI plays in influencing these relationships might similarly vary.

This is especially true since I considered an ability-based measure of EI. Previous researchers of team EI have sometimes viewed the functions of EI as being deployed when one perceives oneself to be socially adept, thus modeling the effects of self reports of EI on team outcomes (Chang et al., 2012; Jordan & Troth, 2004; Troth et al., 2012). The goal of the current study, however, was to decipher how ability-based EI might influence team processes and outcomes. This is a slight, but meaningful distinction. Ability captures a latent skill that an individual can use while perceptions may tap more into motivation or confidence. Believing that one has strong emotional capabilities may have beneficial effects, but it likely works through a different mechanism than the one proposed here (e.g. *ability* to perceive and manage one's own and others' emotions) to influence elaboration and performance. For instance, Troth et al (2012) found that self-reports of team EI increased individual members' communication effectiveness and suggested that this was due to the safer environments harbored in such teams. This provides evidence that self-reports of EI can also be predictive of elaboration but their study differs from the current one in two important ways. Firstly, individual communication effectiveness might not be congruent to team elaboration. One person who is an effective communicator might not translate to there being more lively and meaningful conversation at the team level. Secondly,

Troth et al (2012) purported that the driving mechanism is the better climate that emerges in high EI teams. In the current study, I propose that, with an ability-based measure of EI, an important mechanism is the higher ability to decipher and understand the information that is communicated via other team members' emotions.

In addition to speaking to the literature on EI, this research contributes to work on informational diversity. By pinpointing informational diversity as a boundary condition around the usefulness of elaboration, I add a novel perspective by suggesting that in addition to informational diversity acting as a precursor to elaboration, as other researchers have noted (see van Knippenberg & Schippers, 2007), it can also function to change the *quality* of elaboration. Research on team composition and diversity should therefore consider two types of variables and the different ways they impact performance—variables that lead to more elaboration, and variables that lead to a positive and significant relationship between elaboration and performance. It is interesting that elaboration had null effects on performance in the non-diverse condition, contrary to what was hypothesized. Upon further examination, homogeneous teams had a more limited range of elaboration (e.g. lower levels). This suggests a situation in which homogeneous teams prematurely arrived at a consensus and performed worse. From reviewing the team videos, it looked like homogeneous teams were more likely to quickly come to a decision. The fact that each team member was individually given more clues about how to approach the task seemed to give them a false sense of overconfidence. Conversely, in the informationally diverse condition, participants seem to approach the task with more caution. Because they were given less information, they were less likely to feel that they knew what the "obvious" strategy was, leading to more open questioning about how to approach the task and what strategy the team should follow. This is consistent with my argument that in the

informationally diverse condition, team members were more careful and diligent about the quality of their discussions

The post-hoc finding that no single branch of EI predicted the proposed model as a whole (e.g. the moderated mediation), but that the perceiving branch of EI predicted elaboration, may speak to two things. First, it provides evidence that during team discussions, emotions can send cues about an individual's internal state and that elaboration benefits from a heightened ability to read those cues. This perspective adds to previous research on elaboration that has mainly focused on cognitive (e.g., dissent; Schultz-Hardt et al., 2006) and contextual (e.g., climate for elaboration; Homan et al., 2007) antecedents. Furthermore, it answers a call by van Knippenberg and colleagues (2004) who have noted that although social psychological models of communication see ability as a primary predictor (Chaiken & Trope, 1999), teams and diversity researchers have lagged in this domain. These results are also consistent with cascading theories of EI (Joseph & Newman, 2010) which claims that perception plays a first-mover role because only when individuals can perceive others' emotions can they start to understand it and use that information towards action. Secondly, the empirical finding that no individual facet of EI predicted the whole model presented in Figure 1 lends support to Law et al.'s (1998) theory that when there is interplay between the dimensions of a multidimensional construct, consideration of the latent factor may be the most theoretically sound aggregation as opposed to considering the different dimensions separately.

Furthermore, the post hoc finding that the EI score of the least emotionally intelligent member predicted the model depicted in Figure 1 is consistent with other empirical findings and theories (see Elfenbein, 2006). This suggests that one highly emotionally intelligent teammate may not be enough to improve performance and that instead it depends on the supporting team

members. Having one team member with low EI, on the other hand, can hinder performance. Emotional tones can be contagious (George, 1990) and it is possible that in the current study one low member infected the entire team. Teams with high minimum scores are also those whose weakest member had a relatively high EI and such teams may have found it easier to sustain a minimum level elaboration and performance.

Practical Implications

From an applied perspective an implication of the current findings is that the effective management of a functionally diverse workforce should involve paying attention to the emotional abilities of its employees. If one buys the argument that EI can enhance team processes and outputs, it becomes a powerful tool for managers as they can incorporate these ideas in their selection and training processes. For instance, in situations where it is possible to administer the MSCEIT, managers can use it as an additional variable to select on. In cases where this is less feasible, organizations could offer training classes. In fact, there is evidence that even 1 hour training sessions have long-lasting effects on the ability to read emotions (Matsumoto & Hwang, 2011). For instance, department store employees scored better on social and communicative skills on the job 2-weeks after a 1 hour EI training session. More extensive interventions can also be used to improve individual EI and interpersonal facility (Kotsou, Nelis, Gregoire & Mikolajczak, 2011). Kotsou and colleagues (2011) put healthy adults under 15 hours of targeted training aimed at improving the core emotional competencies and found that this significantly improved mental, physical, and social adjustments, even up to 1 year later. These recommendations may be especially pertinent in situations where teams come from different functional backgrounds and are tasked with making complex decisions.

Limitations and Future Directions

A limitation of the current study is that we manipulated informational diversity by giving participants 6 pieces of additional information distributed across 3 members. Informationally diverse teams in the field, however, may diverge in more substantial ways than this manipulation suggests. Diverse field teams likely diverge on more than 2 pieces of information, may have very different knowledge bases and may have different perspectives about how to approach the task. We urge readers to consider this limitation when interpreting the effects of EI in diverse work teams. A replication of the findings in the field would certainly bolster confidence in the presented theory. Experimental procedures have strength in that their causal inferences are clear (Mook, 1983). In the present design, I was able to manipulate the independent variable and video code the mediator—procedures that would have been difficult in a field setting. However, questions of generalizability are important, and as such, future research that can systematically replicate the results in a different context would be useful. There is evidence, however, from the literature that the proposed relationship would hold outside of the laboratory. Broadly speaking, meta-analyses have shown that effect size of many psychological phenomena is consistent between laboratory and field (Anderson, Lindsay & Bushman, 1999). More specifically, the significant effects of EI on individual (Day & Carroll, 2004) and social (Farh et al., 2012; Cote & Miners, 2006) outcomes in a naturalistic setting abound. Furthermore, in a recent meta-analysis, the effects of diversity on performance are shown to not be affected by field versus laboratory studies (van Dijk et al., 2012).

An interesting possibility along this vein is that the effects of EI on performance are even larger in the field. In organizations, informationally diverse teams are likely to have more aggregate knowledge in addition to it being uniquely distributed among members (see van

Knippenberg & Schippers, 2007). It was not possible to test this under the current design because giving informationally diverse teams more information would have confounded informational diversity with total information. Any difference found between the two conditions could not have been unequivocally attributed to informational diversity. This confounding, however, is likely to occur in informationally diverse field teams that bring members together from different expertise areas (Jehn et al., 1999). Under such conditions, informationally diverse teams are likely to have even more potential to outperform homogeneous teams, thus magnifying the effects of elaboration on performance. While proxying this was undesirable for the current study, it is unlikely that giving homogeneous teams less information would have changed the slope of EI on performance in either condition because what drove this difference was the distribution of information. However, a possibility is that informationally diverse teams might have outperformed homogeneous teams (e.g., there might have been main effects of condition on performance; in the current study, patterns were trending that way but did not reach significance).

Future research would certainly benefit from a more in-depth investigation of different ways to aggregate EI at the team level. For instance, researchers could follow the methods of Tziner and Eden (1985) and explore the differential effects of adding a team member with high (low) EI to a team with all low EI members, a mix of high and low EI members, and all high members. In the current study, there was not enough statistical power to segregate conditions in this way, and since the goal of the study was to understand how overall levels of EI affected outcomes, I chose not to make a priori hypothesis about how operationalizing team EI in different ways would differentially affect outcomes. Along this vein, future research could investigate whether average member EI is the best predictor of outcomes in larger teams or if

another team composition metric is more suitable. For instance, in larger teams, it may be possible that having a few members with high EI is enough to drive performance.

Conclusion

In sum, the present study identified emotional intelligence as an important predictor of team processes and outcomes. Emotional intelligence increases the amount of deep and thoughtful conversations that team members have with one another. This type of communication is especially useful in teams that are composed of members with different knowledge bases. Hiring and training practices should reflect the role of emotional competencies when designing teams, with an emphasis on this point when the team is composed of members from different expertise areas.

Chapter 2: Representational Gaps, Elaboration, and Performance

Theory

An argument from the pre-discussion disagreement camp is that task-related conflict engenders deep conversations and the process of synthesizing different views can lead to better solutions (Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006). To capitalize on such differences, however, team members must also possess enough common ground to synthesize each other's thoughts (Dahlin, Weingart, & Hinds, 2005). I contend that an understudied dimension in the team communication literature, and to move this conversation along, one needs to consider the level of *compatibility*—or the extent to which differences are not mutually exclusive—between team members' mental representations of the task. Whereas a simple difference may be used to inform another group member or synthesized in an integrative, win-win fashion (Wittenbaum et al., 2004), I propose that differences stemming from

incompatibilities do not take on these characteristics. Such differences tend to be win-lose, harder to resolve, and cause misunderstandings.

The 2nd chapter of my dissertation seeks to empirically examine whether and how incompatible cognitions affect information elaboration. To do so, I draw on representational gaps theory, which Cronin and Weingart (2007) have conceptualized as mutually exclusive ways of defining the team's problems (e.g. task) and solution space.

For example, consider the case of a British String Quartet. These quartets are highly interdependent work teams that rely on each other for a collective output— to "produce transcendent, glorious sound—for an extended period of time" (Murnighan & Conlon, 1991 pp. 167). To do this, they spend a lot of time playing together and discussing the interpretations of a piece (Murnighan & Conlon, 1991). Members of a Quartet can have different representations of the task—one person may believe that the goal of the piece is to elicit a feeling of excitement in its audience while another person may believe that it is to elicit a feeling of satisfaction. These representations are different and would probably lead to dissimilar mental models, but they do not necessarily constitute a representational gap as the two players' desires are not mutually exclusive. On the other hand, if one player wanted the piece to have an explosive and disconnected quality while another player wanted it to have a flowing and continuous quality—this would likely constitute a representational gap because the two interpretations cannot co-exist, at least in their initial forms.

Representational Gaps Defined

A representational gap is a team level construct that arises when team members have fundamental incompatibilities in the way they view a specific problem and its solution space

(Cronin & Weingart, 2007). I stress the term incompatible because representational gaps reflect a mutual exclusivity, and not just differences, in team members' perspectives

A person's representation of a task is the cognitive map they hold regarding that task—its objective, the possible solutions, the actions that can lead to those solutions, and the causal chain that link the moving parts (Hayes & Simon, 1974; Newell & Simon, 1972). A representation provides the framework for understanding the problem, and as such, guides subsequent action that is meant to solve the problem (Cannon-Bowers et al., 1993; Klimoski & Mohammed, 1994). Representations can certainly be construed from general schemata and frames, but whereas the later refers to general templates used to make sense of a large class of problems (Kunda, 1999), representations are the perspectives taken by an individual on a specific organizational problem. Representations are useful because they simplify the problem and guide attention to what is important (Cronin & Weingart, 2007; Hayes & Simon, 1974). Problem solving involves processing information that is germane to the current setting and evaluating the meaning of that information to select among possible moves that lead to the desired end state (Hinsz, Tindale, & Vollrath, 1997). A representation guides both the evaluation and synthesis of information and reduces the amount of cognitive load it takes to understand and interpret the task, streamlining decision making.

For a particular problem, the task representation is composed of a goal hierarchy, assumptions, elements, and operators (GAEO; Hayes & Simon, 1974; Newell & Simon, 1972). A representational gap manifests itself when GAEOs are misaligned (Cronin & Weingart, 2007). The *goal hierarchy* is a ranked list of objectives that need to be met for the problem to be solved (e.g. a republican may believe the goals of a federal healthcare code are to minimize federal budget and enable individual states to take action and views the former as more important than

the later). The *assumptions* are the parts of the problem that are taken as given (e.g. a democratic lawyer's view that people are constrained by their situation versus a republican lawyer's view that people more or less have equal opportunity). The *elements* are the pieces of the problem that are moveable (e.g. allocation of health care subsidy for specific groups) and the *operators* are the rules for how to move those elements (e.g. the more that is given to a certain group, the less others will have).

Not all gaps are the same size—some may be very large when team members possess different visions of an ideal end-state and encompass many incompatibilities among the GAEOs. Others are much smaller, such as when a gap is related to a specific issue, and only incompatible in an assumption, element or operator. Any differences in goal hierarchies, however, should constitute a large gap. Goals are critical for problem solving because tasks tend to be defined by the goals they should achieve (West & Anderson, 1996). Furthermore, goals have the highest sensitivity to incompatibility because even if multiple goals can be achieved (e.g. social welfare and profit maximization) limited resources will likely dictate that some need to be put in front of others. For instance, in the case of healthcare laws, all teammates might value economic thriftiness and holistic coverage, but the tension between the two would force members to make choices about the relative importance of each. Goals are the non-negotiables of teamwork (Weingart, Todorova, & Cronin, 2010) and when they are disparate create chasms for interpreting the task. Research has shown that when teammates share different goal hierarchies it leads to different interpretations of what constitutes an adequate solution and ultimately incompatibilities in how to move forward (Weingart, 1992; West & Anderson, 1996).

Representational Gaps and Information Elaboration

I posit that representational gaps will make information elaboration at the team level difficult. Information elaboration is a multi-layered concept that involves the careful exchange, dissection, and integration of information between team members (van Knippenberg et al., 2004). Elaboration is important for team decision making because constructively sharing ideas and building on each other's understanding is key to creating team products that are more than the sum of individual inputs (see Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007).

Trying to communicate across a gap is akin to trying to solve a problem speaking different languages. One way that gaps can degrade information elaboration is because gaps can lead to misinterpretation between team members (Cronin & Weingart, 2007). Information may be distorted or weighed differently when individuals have different goals in mind (Balcetis & Dunning, 2006), or it can be misunderstood when parties are not fully educated about each other's issues. For instance, a concept in one functional area sometimes has no equivalent in another or the nuances of the concept is not the same and sophisticated use of those concepts and the vocabularies surrounding them is difficult (Bechky, 2003). Another way that gaps can degrade information elaboration is because it is hard to integrate information across a gap. Gaps imply that team members are not facile in each other's domain (Weingart, Cronin, Houser, Cagan & Vogel 2005)—making it difficult for team members to have a holistic understanding of the problem. Thinking about trade-offs between components of the problem can become inefficient as pros and cons are not fully understood by all team members. The costs to elaboration associated with incompatibilities can outweigh the salubrious effects that simple disagreements engender, such as decreasing discussion bias and increasing discussion intensity (Schulz-Hardt et al., 2006).

Past research has shown that individuals embedded in different thought worlds communicate less frequently (Zenger & Lawrence, 1989) and effectively (Triandis, 1960) with each other. Dougherty (1992), across five firms, found that employees are bound to departmental and organizational thought worlds and that differences in such mental representations kept them from synthesizing their expertise. Similarly, other researchers have found that communicating in a way that builds on previous information is hard to achieve when there is no common interpretive frame (Bechky, 2003; Weingart et al., 2005). Taken together, I predict that:

Ch2, H1: Representational gaps negatively predict information elaboration

Information elaboration is a cornerstone of effective team functioning. Empirical evidence has also given ample evidence of the significant role that information elaboration plays in team performance across a variety of settings (e.g., Homan, van Knippenberg, van Kleef, & de Dreu, 2007; Kearney et al., 2009; van Ginkel & van Knippenberg, 2008). Taken together, I predict that:

> *Ch2, H2: Information elaboration mediates the negative relationship between representational gaps and performance. Teams that have large representational gaps will elaborate less which in turn will decrease performance.*

Methods

Design

In the current study I developed a new way to measure representational gaps and use it in a laboratory experiment to test the proposed hypotheses. The current study therefore measures or independently codes all variables of interest without incorporating manipulations.

Sample and Procedures

A total of 150 graduate and undergraduate students from a large East Coast University participated in the experiment in exchange for course credit or cash ($10). Teams who completed

the task in the top 10% were given an additional $60. Participants were randomly assigned to one of 50 three-person teams.

Students participated in the experiment in groups of 3. Upon arrival to the lab, participants were told that the purpose of the study was to examine group decision making and were asked to take their place behind individual computer stations to fill out a pre-task questionnaire. This questionnaire measured participants' task representation and demography. When all team members had completed the pre-task questionnaire they were given written instructions about the decision making task and invited to proceed when they were ready. Participants were given 40 minutes to complete the task. After the task, participants were asked to fill out a post-task questionnaire that included the measures for team processes.

The Task

The task is listed in Appendix B. Participants engaged in an interdependent decision making task that required the discussion and integration of many possible solutions to create one answer. To increase the psychological realism and generalizability of the current study (Colquitt, 2008), I aimed to replicate a task whose representation would be personal to participants. To do this, I took advantage of the very public and heated debates surrounding the Affordable Healthcare Act to engage students in the current task. At the time of the task, the Affordable Healthcare Act had not been passed but was going through extensive lobbying and was a popular topic in the news. The premise of the act was to make purchasing health insurance mandatory. A central issue under discussion concerned individuals who may be unfairly burdened by this policy and might need monetary assistance in purchasing mandatory insurance (Sorrell, 2012).

While one may argue that not all people hold strong opinions about politics or specifically healthcare, the questions central to this task are really issues of equity, human rights,

and human nature—representations that are well formed by the time an individual reaches adulthood (Kunda, 1999). Deciding how to allocate a scarce resource across different groups requires making judgment about how the needs of each group compares to that of other groups'. I chose this task because I wanted to ensure that participants had an *a priori* representation of the problem. These representations were in turn related to the requirements of the task, mimicking how representational gaps may play out in an organizational setting.

I told participants to assume the role of policy analysts and to create a plan that lays out how the government will subsidize certain groups of people. Teams were given the task of 1) allocating a limited set of points *across* three categories of people: those below a certain income, the elderly, and non-U.S. citizens, 2) delineating a general plan for how the assigned points would be distributed *within* each group, and 3) writing a rationale for their choice. This task required team members to think about *tradeoffs* between components of the task—thus laying a ripe platform for playing out the effects of gaps.

I developed this task, as opposed to using an existing one because of the specific nature of representational gaps. However, the requirements of this task closely parallel that of other decision making task used in laboratory studies (e.g. van Ginkel & van Knippenberg, 2008) and field studies that use MBA students and business cases (e.g. Dahlin, Weingart, & Hinds, 2005). Namely, this task required that participants discuss many possible solutions, integrate different ideas, and create a holistic team product.

Measures

Representational gap. The items used to measure representational gaps are listed in Appendix C. The key to measuring representational gaps are twofold—items measuring task representation must be intimately tied to aspects of the *current* task and they must reflect

incompatibilities (not just differences) in team members' ideas. To achieve the first goal, I generated question items that were narrowly focused on participants' view about the task. I asked participants, for example, to rate the extent to which they agreed with statements like "Non-US citizens should receive health care subsidies" on a task that asked them to provide a rationale for why they would or would not subsidize non-US citizens. I wanted to capture representations that were specific to the task and not broader belief-systems. For this reason, I generated our own items instead of using previously developed scales that might tap into general schemas that people use to make sense of many aspects of the world. In the current task, differences in political ideology should correlate with gaps but not all conservative-liberal pairs will have incompatible standings on how to subsidize non-US citizens for healthcare. Therefore, had I used a previously developed scale measuring ideology, (e.g. Levenson & Miller, 1976) I might think that a representational gap exists where it does not or vice versa. The second goal—to quantify incompatibility—was achieved by juxtaposing items so that they negated each other. I designed the items so that some were the opposite of others—this design meant that if two people had a negative correlation between their set of items, they had opposite views on the role that the government should take in subsidizing that group. I generated 9 such items for participants to rate on a 7-point scale ranging from strongly disagree to strongly agree, and then correlated each team member's vector with each other team member. Correlations ranged from -1 to +1, and a higher number meant that the dyad had less representational gaps. To facilitate interpretation, I reversed the sign of this measure. Table 4 gives examples of the gap measure of participants and their accompanying points view. Following prior work on aggregating team cognition variables (see DeChurch & Mesmer-Magnus, 2010), I averaged the 3 dyadic correlations to create a team level representational gap measure.

Table 4. Description of Rgaps in the Current Task

Correlation*	Gap size	Description
-0.75	Large	Two participants rated the opposite of each other in all three categories. One participant highly agreed that poor, elderly, and non-US citizens all deserve subsidies (items 1, 4, 7) while the other participant highly disagreed with these statements and instead agreed with the opposite items (items 3, 6, 9) signifying the belief that none of these groups deserve subsidies (perhaps this participant views healthcare as a privilege and not a basic right worth spending tax dollars on).
-0.5	Medium	Two participants rated the opposite of each other in two categories and similarly in one category. One participant believed that each of the three groups deserve subsidies while the other participant believed that the poor deserve subsidies but that there should not be any additional subsidies given to the elderly, nor should there be any subsidies given to non-US citizens.
-0.25	Small	Two participants rated the opposite of each other in one category and similarly in two categories. One participant believed that non-US citizens do not deserve any subsidies while the other participant believed that non-US citizens deserve the same treatment as US citizen. However, these two participants agreed about the amount of subsidies that should be given to US citizens that are poor or elderly
0	No gap	Two participants did not rate the opposite of each other in any category. One participant believed that all three categories deserve some subsidies (but be more stringent about the conditions; e.g. rated highly items 2,5,8) while the other partisan believed the same thing but was less stringent about the conditions (e.g. rated highly items 1,4,7)
> 0	No gap	Two participants did not rate the opposite of each other in any category (more positive number implies closer agreement on the exact items).

*Approximate dyadic correlation with more negative numbers representing larger gaps.
This number is reversed in subsequent analysis for ease of interpretation
In a team of 3, it was most often the case that two people had similar views (one positive correlation) and one person had a different view from the other two (two negative correlations).
Most teams contained at least one negative correlation. Therefore the gap measure is not a measure of how similar the participants' perspectives are (as would be the case if all correlations were positive).

Construct validation. I examine the construct validity of the representational gap measure by testing whether it is correlated with a variable that it should theoretically be correlated with--perceived goal differences. As I have elucidated above, misaligned goal hierarchies likely lead to gaps because limited resources make it necessary that certain objectives be put in front of others. This should surface during team interactions and teams with large gaps should perceive, more so than teams with small gaps, that members are moving towards different goals. To examine the convergent validity of gaps I measured perceived goal differences using two items adapted from Jehn (1995). Items were "All members of my team wanted to move in the same direction" and "the main goals of my team were the same for all members" (both items were reversed). Participants answered on a 5-point scale ranging from strongly disagree to strongly agree (α = .83). Aggregating perceived goal differences to the group was justified because of reasonable reliability scores (ICC[1] = .32 , p =.0001; ICC[2] = .58; r_{wg}=.81).

Information elaboration. I measured information elaboration using four items developed by Kearney et al. (2009). This scale was developed based on the extant literature. Sample items include "The members of this team carefully consider all perspectives in an effort to generate the optimal solutions" and "the members of this team carefully consider the unique information provided by each individual team member." Participants answered on a 5-point scale ranging from strongly disagree to strongly agree. (α = 0.78). Aggregating information elaboration to the group was justified because of reasonable reliability scores (ICC[1] = 0.2, p < .01; ICC[2] = .43; r_{wg}= .97).

Task conflict as control. Because the present dissertation is interested in the correlates, antecedents, and outcomes of having incompatible perspectives, I wanted to control for what should be a theoretically related situation—when perspectives are merely different. Jehn (1995)

defined task conflict as "differences in viewpoints, ideas, and opinions" (pp. 258). I wanted to make sure that any results from the gaps would be due to incompatibilities in perspectives and not task conflict, or mere differences in how to approach the task. I measured task conflict using the four item scale developed by Jehn (1995). This scale asks participants to rate how often there are differences of opinion and conflict about the work being done. Participants answered on a 5-point scale ranging from strongly disagree to strongly agree.

Other controls. Surface-level diversity has sometimes been linked to team functioning because of categorization processes that leads to an "us-versus-them" mentality (see van Knippenberg & Schippers, 2007). This process can decrease elaboration and increase conflict which can then impair performance (Tajfel, 1982). I therefore control for racial and gender diversity by taking a Blau's index of heterogeneity for each variable. I did not control for age diversity given the relative homogeneity of participants along this dimension. However, I did control for the number of graduate students (MBAs) in the team because that might be related to experience or intelligence and influence processes and outcomes (Hunter, 1986).

Performance. The dependent variable of interest was team performance which I assessed by evaluating the healthcare policy plans that teams wrote. To gauge performance I used two metrics: the range and integration of team write ups (Dahlin et al., 2005; Tetlock, 1986). Range refers to the number of distinct ideas that team members brought up in their rationale and is a measure of the variety of information used. Range is an important component of performance because when making complex decisions, teams must be able to consider many issues (Tetlock, 1986). Integration refers to how well teams have structured their rationale and how much they considered the inter-relationship between components of their plan. Criteria for evaluating

integration included how well teams explained the reasoning behind their policy points, the logical links they used to support their reasoning, and the overall quality of the plan.

Range was coded by two independent raters who counted the number of unique propositions that teams came up with in their rationale. Any disagreement was reconciled by discussions between the coders and the first author. Integration was also coded by two independent raters who were extensively trained on the criteria for discerning the integration level of team write-ups. Again, disagreements were reconciled by discussions between the coders and first author. Integration was coded on a 5-point scale.

Results

Means, standard deviations, and correlation coefficient for all measures at the team level are reported in Table 5.

Table 5. Descriptive Statistics

	Variable	Mean	SD	1	2	3	4	5	6	7	8
1	Task conflict	2.49	0.56								
2	Total grads	0.58	0.67	0.24							
3	Gender diversity	0.36	0.18	-0.13	-0.17						
4	Ethnic diversity	0.48	0.18	0.19	0.22	0.05					
5	Representational gap	0.24	0.29	0.2	0.07	-0.04	0.15				
6	Information elaboration	4.08	0.39	-0.51	-0.02	0.27	-0.04	-0.36			
7	Goal difference	3.89	0.63	0.67	-.004	-0.27	0.01	0.42	-0.77		
8	Range	13.24	5.17	-0.37	-0.03	0.03	-0.2	-0.34	0.39	-0.37	
9	Integration	3.65	0.7	-0.37	-0.17	0	-0.27	-0.4	0.19	-0.32	0.66

Note. N = 50 teams
Correlations > .28 (absolute value) are significant .05

Preliminary Analysis

Construct validation. Regression results showed that perceived goal differences and representational gaps were significantly correlated after controlling for demographic variables and task conflict (β = -.66 p = .003).

Confirmatory factor analysis. Due to the high correlation between task and relationship conflict, I conducted a CFA to determine whether participants could distinguish between the two. A CFA on the four item task and relationship conflict scale showed that a two-factor model fit the data well ($\chi^2/df = 1.64$; CFI = .98; TLI = .96; IFI = .98; RMSEA = .07), and that it exhibited a significantly better fit than a one-factor model ($\Delta\chi^2(1) = 27.65$ p < .01). Even though task and relationship conflict were strongly correlations, participants were able to distinguish between the two. Theoretically and empirically speaking, it is not uncommon for the two conflict dimensions to correlate. In a recent meta-analysis, de Wit et al., (2013) found that the mean correlation between task and relationship conflict was .52 with a standard deviation of .32.

Substantive Analyses

Substantive analyses are replicated in Table 6. Hypothesis 1 predicted that representational gaps would decrease information elaboration. Regression results show that representational gaps did decrease information elaboration (β = -.36, *p* = .03), supporting hypothesis 1.

Table 6

Mediation Regression for Representational Gaps on Performance

	Elaboration		Performance: Range			Performance: Integration		
Independent Variables	1	2	3	4	5	6	7	8
Controls								
Ethnic diversity	.04	. 11	-4.54	-3.65	-4.47	-.76	-.61	-.70
Gender diversity	.50 †	.49 †	0.29	.13	-2.67	-.16	-.19	-.48
Grad students	.08	.08	0.71	.71	.14	-.06	-.06	-.13
Task conflict	-.36**	-.33**	-3.35**	-2.92*	-.07	-.41*	-.34†	.14
Main Effects								
Representational Gap		-.36*		- 4.58 †			- .76*	
Mediators								
Information Elaboration					2.90			-.20
R-squared	.32	.39	.16	.23	.26	.18	.27	.32
Change R-squared		.07*		.07†	.10†		.09*	.14*

Note. N = 50 teams
† $p < .10$
* $p < .05$
**$p < .01$

Hypothesis 2 predicted that information elaboration would mediate the relationship between representational gaps and performance. I performed the steps laid out in Baron and Kenny (1986) to test for mediation. Hypothesis 1 showed that gaps were significantly related to elaboration. Next, I regressed representational gaps on the two performance measures: range and integration. Gaps were significantly related to integration ($\beta = -.76$, $p = .02$) but only marginally predicted range ($\beta = -4.58$, $p = .06$). Furthermore, elaboration did not significantly predict range ($\beta = 2.9$, ns) or integration ($\beta = -.20$, ns). Therefore, Hypothesis 2 was not supported.

Discussion

The current study showed that representational gaps can be measured and that they exert significant influence on team processes and outcomes. Gaps decreased the quality (and to a marginal extent quantity) of team outputs. Furthermore, they blocked information elaboration, a cornerstone of effective team functioning.

Contrary to predictions, elaboration did not significantly affect performance. Deep communication is often considered a prime mechanism through which decision-making teams arrive at optimal solutions (van Knippenberg et al., 2004). However, upon further consideration, researchers have suggested that the effects of elaboration are not uniform in all situations and that instead it depends on how biased discussions are (Brodbeck et al., 2007). In the current study, it is possible that because of the controversial nature of the task, participants were not willing to make concessions on issues. Instead, each person might have just repeated their initial point of view, biasing the conversation and not leading to any gains in performance.

Implications

Theoretical Implications

The current study undermines the importance of considering compatibility in addition to mere differences in team cognition. The 2nd chapter of my dissertation points to an important qualification of the value-in-diversity perspective of team performance. Cognitive diversity literature has stressed the importance of having a variety of opinions (see van Knippenberg & Schippers, 2007) without speaking to their potential for coexistence. In the current study, task conflict only exhibited a marginal effect on integration whereas representational gaps significantly hurt integration. This nuance may address some inconsistencies in the literature

which has found that cognitive diversity can exhibit a positive, a negative, or no relationship with performance (Webber & Donahue, 2001). Specifically, it is possible that in some cognitively diverse teams differences were accompanied by gaps which led to the negative main effects of diversity on performance, whereas in other teams only a simple difference existed, leading to a positive main effect.

One mechanism through which diverse cognitions is purported to function—that having to reconcile multiple viewpoints forces team members to flesh out their ideas and have deeper and more accurate discussions (Schulz-Hardt et al., 2006)—may be possible only in the absence of gaps. The information / decision-making perspective of diversity has acknowledged that oftentimes elaboration does not happen automatically and that instead it depends on the motivation (Kearny et al., 2009) and beliefs (Homan et al., 2007) of members and the climate of the team (Edmondson, 1999; Morrison, Kamdar, & Wheeler-Smith, 2011). The current study extends this line of research by bringing in what sociologists have previously observed about knowledge transfer—that project teams often see an organizational task through their departmental "thought worlds" (Dougherty, 1992) and that communication across these thought worlds can be mired in misunderstandings (see Okhysen & Bechky, 2009; Weingart et al., 2005). This perspective suggests that representational gaps can decrease the *ability* of team members to elaborate as they truly do not have the mental representation to understand the other person's perspective. Examining an ability-based antecedent to elaboration answers a call made by van Knippenberg and colleagues (2004, pp. 1012) that ability is more or less a neglected variable in communication research even though it is considered a primary predictor of deep-level processing of information in social psychological models of social perception and judgment.

In addition, the two performance measures—range and integration—and their different relationship with gaps, shed further light on the nature of gaps. Gaps most negatively impacted integration—or the ability of team members to synthesize each other's perspectives. They only marginally affected the breadth of ideas that team members came up with. This is sensible given the theorizing that gaps lead to misunderstanding and thus integration capabilities, which would decrease team members' ability and motivation to work towards common ground, but not necessarily (or to a lesser extent) their ability to generate a range of ideas. Therefore gaps might not be as hurtful to performance when interdependence is low. Unfortunately, in many complex decision making settings, having an overall vision and coherent logic is what sets apart a good decision from a bad one. In fact, researchers have suggested that complex problems, such as those that pervade current events, require integratively complex solutions (Tetlock, 1986). These problems require solutions that have both breadth and integration—solutions that acknowledge the tension inherent in multiple objectives and can effectively navigate them.

Practical Implications

Practically speaking, these findings show that given the nature of gaps, they can pose a double threat to cognitively diverse teams because gaps are likely to overlap with functional diversity (Dougherty, 1992; Weingart et al., 2005) and cause a breakdown in the processes that such teams need most. Representational gaps block information elaboration—the key to unlocking diversity's potential and heighten relationship conflict—adding to the difficulty of such teams to get along and capitalize on their differences.

When gaps are present, increasing elaboration may not be just a matter of increasing motivation or decreasing conformity pressures, but increasing team members' ability to understand each other. The present research shows that in teams with large representational gaps,

it may be worthwhile to invest in educating members in the nuances and concepts of others' functional areas to decrease misunderstanding and ease the flow of information exchange.

Limitations

This study was collected using a student sample and in a laboratory setting. This may bring into question the generalizability of the results. Questions of external validity hinge on whether the present findings would in fact be found in real organizations. While, only future field studies can fully address this question, the present study took multiple steps to ensure setting up a platform that would mimic how representational gaps may play out. Namely, I used a task and representation that was personal and well engrained in participants' minds. Therefore, the outcomes of this experiment should be similar to the outcome of representational gaps in organizations. Because conflict centering on representational gaps may occur relatively infrequently as a percentage of total interactions, simulating it in a laboratory may be wise in terms of trying to take a first stab at understanding the phenomena. Future researchers should certainly find settings where representational gaps may be common and ways to study them in the field.

Future Directions

Having linked this research to the body of work on diversity, future research may want to consider which dimensions of diversity are correlated with representational gaps. By developing a clearer picture of what drives representational gaps, we can begin dialoging about how to bridge them for more effective team functioning. For instance, do gaps emerge early on from a person's choice of major in college or later on from accumulated professional experience? Or are they more correlated with personality variables or functional background? Answers to these

questions would shed light on the rigidity of representations and why they are potentially dysfunctional.

Future research should theoretically examine and empirically test ways to bridge gaps. Above I have elucidated possible interventions to increase elaboration. In addition, research on early team processes may be relevant in thinking about how to mitigate gaps. This line of work suggests that teams who spend time upfront to discuss interaction norms (Earley & Mosakowski, 2000; Ericksen & Dyer, 2004) and learn about each other as individuals (Swann, Polzer, Seyle & Ko, 2004), benefit the most later on. Because teams that suffer from gaps are susceptible to misunderstandings, goal clarification early on (Woolley, 2009) Another avenue includes considering ways to unfreeze representations and bring new concepts into the fold of existing representations. Research on sensemaking has discussed this in terms of getting people to eschew their standard practices and encompass new situations that may not fit neatly into their routine (Weick, 1996). Unfreezing prior cognition is also a theme in minority dissent and creativity literatures. For instance, Nemeth has shown that being exposed to a dissenting view can sometimes force a reexamination of the original stimuli and re-framing of the problem (Nemeth, 1986).

Chapter 3: Early Elaboration and Performance Trajectories

Theory

Researchers have suggested that early team processes can have a disproportionately large impact on later performance because they set the stage for team interactions and capabilities (Hackman & Oldhman, 1976, Gersick, 1988, 1989). Empirical evidence also supports this line of reasoning. For instance, Ericksen and Dyer (2004) found that the behavior of a team early on

influenced the path on which that team later traveled and that this path was self-reinforcing. Teams that demonstrated effective processes in the launch period were propelled towards a virtuous path because they were equipped, from their early interactions, to handle later difficulties. Teams that did not, travelled down a vacuous path that became harder and harder to deviate from. Along a similar vein, Mathieu and Rapp (2009) found that the quality of a team's pre-task written contract predicted performance many periods out.

Although scholars have advocated for the need to conceptualize teams as dynamic (Cronin, Weingart, & Todorova, 2011) and examine their performance over time instead of as a snapshot in time, few team studies have included longitudinal measures and none to our knowledge incorporate elaboration as the independent variable. As I have previously elucidated, given the importance of elaboration and the conceptualization of teams as information processors (Hinsz et al., 1997), the 3rd chapter of my dissertation examines how elaborating early on influence performance trajectories and end-state performance over time. This perspective has roots in the dynamic criteria literature (Hofmann, Jacobs, & Baratta, 1993; Landis, 2001) which suggests that rates of change—or performance trajectories (and end-state performance by association)—can vary between teams and that examining the factors that give rise to this variance has implications for the overall effectiveness of teams.

I propose that teams that elaborate early on will be set on a virtuous path, and small early advantages will grow into big performance gaps. Knowledge-based teams process information rather than physical goods and typically face tasks that are complex and non-routine (Von Nordenflycht, 2010). In light of this, engaging in intense and unbiased discussions should improve the quality of team decisions. Deep elaboration means that team members are likely considering multiple angles of the problem and carefully weighing the pros and cons of the

decision parameters, as opposed to prematurely arriving at a solution. This vetting process should lead to more developed, comprehensive, and accurate action plans that have a higher probability of succeeding (Homan et al., 2008; Kearney et al., 2008; van Ginkel et al., 2008). An initial strategy that has been thoroughly vetted through debate and serious consideration of alternatives is more likely to have considered multiple components of the task and be better fitted to the environment. Conversely, incomplete strategies may overlook important aspects of the task and lead teams towards a suboptimal path. This advantage should translate into better performance trajectories and end-state performance. Devising an early strategy that is better fitted to the external environment decreases the chance of having to change strategies midway. Time-pressured environments have less room for error and having to change course can compromise the quality of the final product and the speed at which project completion occurs (Ericksen & Dyer, 2004).

Elaborating early on can also lead to the development of a shared understanding of the task. When teams spend the time to explicitly delineate the boundaries of the task and clarify the content of what needs to be accomplished teams are more likely to develop a shared mental model of the team's ideal end-state (see Kellermanns, Walter, Floyd, Lechner, & Shaw, 2011) This convergence can impact performance trajectories and end-state performance. Shared understanding can increase the coordination and efficiency of task execution (Cannon-Bowers, Salas, & Converse, 1993; Klimoski & Mohammed, 1994). Over time, the minutia of goal accomplishment need to be sorted out and dealt with. Strategic directions, however, is rarely fully articulated and complete and details must be brought into the fold as they occur (Mintzberg, Raisinghani, & Theoret, 1976). When team members are collectively aware of the rationale behind a strategy, as is the case when task cognitions are shared (Kellermanns et al., 2011),

subtask can be handled in a way that is consistent with the intention behind the plan (without having to explicitly coordinate every detail; Mohammed, Ferzandi & Hamilton, 2010). These efficiencies should positively impact performance trajectories and end-state performance. Better coordination capabilities decrease the chance of move conflict (Cronin & Weingart, 2007) and increase the speed of task accomplishment (Marks, Sabella, Burke, & Zaccaro, 2002). Therefore rather than spending time backtracking to iron out any inconsistent actions, teams can focus on accomplishing tasks that move them forward, and do so more efficiently. In support of this, Marks and colleagues (2002) found that shared cognitions improved the coordination of interdependent activities as team members were better at orchestrating the sequence and timing of their own subtasks, which in turn improved performance.

Lastly, elaboration can allow teams to develop a deeper understanding of the task (Amason, 1996) that enables flexible thinking in dynamic environments (Woolley, 2009). As teams spend the time to clarify the content of the task, members should become more familiar with the nuances and tradeoffs between components of the task. Therefore, when unforeseen events occur, this superior and more holistic understand of the task will allow members to make high quality new decisions quickly. Being able to quickly and accurately make new decisions in real-time minimizes any loss that is incurred from following an expired strategy.

Ch3, H1: Elaboration is positively associated with a) performance trajectories over time and b) end-state performance

Methods

Participants and Setting

Participants (N = 139) were undergraduate and graduate students enrolled in a business simulation course at a large northeastern university. Students were assigned to 30 teams of three-

five members each (M = 4.7). The mean age of the students was 22.1 years with 40 percent female. The ethnic composition was 54% Caucasian, 29% Asian, 9% Hispanic, 2% African American, and 6% other.

The business simulation course required team members to work as the top management team of a business that produced and sold solar and wind power accessories. Teams made an array of decisions regarding the company's strategy, operations, financing, marketing, and R&D investments. Teams competed against each other in a virtual market. All teams began with an equal amount of resources and made a set of operating decisions for each simulated year. Because of the scheduling of courses, one undergraduate section played for eight simulated years (N = 10) while others played for seven years (N = 20 teams). After each round of decisions teams received a number of metrics about their company such as financial performance, product reception, inventory, market outlooks, and so on that could be used as input for next round of decisions.

Prior to the start of the simulation, students were given a 23-page manual about the business they would be running. Based on research that shows that team processes take time to stabilize (McGrath, 1991), elaboration was measured at the end of the second decision making period.

Measures

Elaboration. I measured information elaboration using a three item scale adapted from Homan et. al's (2008) to reflect the longitudinal nature of the current task. Scale items were rated as agreement or disagreement on a seven-point Likert scale, and included questions such as "members of my team took the time I needed to share task-related information", "members of my team actively learned from one another" and "members of my team effectively communicated

with each other throughout." This scale exhibited good internal reliability (Cronbach's alpha = .74). To justify aggregating to the team, we ran interrater reliability and agreement statistics which exhibited significant agreement (ICC(1) = .18 ICC(2) = .48 p =.01).

Performance. Performance was operationalized as the stock price of each team after each performance round (simulated year). This metric was automatically generated by the simulation software. I used stock price because it takes into account a set of parameters such as revenue, profitability, customer perceptions of quality and brand reputation, market share, and credit worthiness, which together reflect the quality of each team's decision-making.

Controls. I controlled for variables that have been linked to team processes and performance. Specifically, I controlled for cognitive ability (Devine & Philips, 2001) using each team's average GPA. Furthermore, given the abundant literature on diversity being a source of social-categorization in teams (c.f. van Knippenberg & Schippers, 2007), I controlled for ethnic and gender diversity. I did not control for age diversity since teams were largely homogeneous in age. Since teams were comprised of either all graduate or all undergraduate students, I dummy coded a "grad" variable as a control. Lastly, I controlled for team size.

Analytical Strategy

The design of this study conforms to a two-level or mixed-model framework. Performance constituted the within-team, or time-varying, variable (e.g. Level 1, 7 or 8 repeated measures) and elaboration as the between-team variable (e.g. Level 2). Because of the hierarchical nature of the data, within team errors (that is, the error term associated with the repeated performance measures over time, within each team) will exhibit some degree of autocorrelation and may not be independent. For this reason I employed the multilevel growth modeling technique (Singer & Willet, 2003, also referred to as hierarchical linear modeling),

which allowed me to examine differences between teams' performance trajectories while taking care of biased error terms by nesting time within team.

The intuition behind multilevel growth modeling is to examine whether level-2 variables can explain differences in rate of change. Performance trajectories can therefore be thought of as the dependent variable and elaboration as independent variables. This is the technique I use to examine H1a. To examine H1b, I centered time at year 8 so the intercept reflects end-state performance. Since these are fitted performance measures, year 8 performance can be extrapolated for the teams whose last performance measure ended at year 7[2]. I then examined the effects of elaboration on this intercept.

Prior to venturing into substantial analyses, I conducted a series of baseline analyses to ensure that there was enough between-team variability to justify testing the hypothesis. I first modeled the unconditional means model (null or baseline model) which partitions the variance in performance into within-team (variance that can be explained by time) and between-team variance (variance that can be explained by level-2 variables). A significant between-team variance component would indicate the appropriateness of incorporating level-2 variables to explain differences in performance across teams. Next I fit the unconditional growth model which incorporated only the time measure (e.g. before any of the predictors were entered). This model serves as a baseline comparison to later models that do include predictors. Furthermore this model ensures the tenability of the longitudinal data structure by examining the assumption that team performance changes over time. Lastly, I centered all predictors before entering them into the model.

[2] I also conducted end-state performance analyses on year 7. The results are the same as the ones I present in year 8.

Table 7. Descriptive Statistics

	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Ethnic diversity	0.48	0.20													
2	Gender diversity	0.41	0.13	0.10												
3	GPA	3.39	0.23	0.06	-0.29											
4	Grad	0.33	0.48	-0.02	-0.11	0.32										
5	Team Size	4.63	0.56	0.07	0.36	-0.37	-0.69									
6	Elaboration	5.91	0.45	-0.09	0.03	0.04	0.43	-0.24								
7	Performance 1	6.73	2.05	0.01	-0.20	-0.18	-0.33	0.30	-0.17							
8	Performance 2	10.37	5.73	0.15	-0.22	-0.20	-0.40	0.30	0.00	0.71						
9	Performance 3	16.30	10.78	0.22	-0.26	-0.10	-0.26	0.04	0.04	0.49	0.70					
10	Performance 4	25.22	18.38	0.24	-0.21	-0.01	-0.22	0.09	0.09	0.42	0.61	0.91				
11	Performance 5	32.97	25.79	0.22	-0.28	0.11	-0.14	0.01	0.13	0.23	0.52	0.85	0.93			
12	Performance 6	41.13	33.31	0.26	-0.22	0.17	-0.05	0.00	0.20	0.19	0.51	0.70	0.84	0.94		
13	Performance 7	57.00	51.66	0.26	-0.17	0.17	-0.05	0.00	0.18	0.17	0.43	0.60	0.74	0.85	0.96	
14	Performance 8	95.12	121.65	0.49	0.16	0.23	0.00	0.00	0.44	-0.21	0.17	0.51	0.80	0.88	0.97	0.99

Results

Descriptive statistics are listed in Table 7. The unconditional means model indicated that 73% of the total variance in team performance resided within teams (over time) and 23% between teams. The between team variance was significantly different from zero (χ^2 = 8.02, df = 1, p = .004). Next I fit two unconditional growth models. The linear ($\Delta\chi^2$ = 336.24, df = 3, p < .001) and quadratic ($\Delta\chi^2$ = 366.14, df = 4, p < .001) time trend exhibited a significantly better fit than the unconditional means model indicating that team performance does grow over time. Furthermore, the between team variance in this rate of change is significantly different from zero (linear: χ^2 = 13.51, df = 1, p < .001; quadratic: χ^2 = 13.70, df = 1, p < .001). These analyses suggest that enough between team differences exist in average performance and performance trajectories to add level-2 predictors.

The quadratic model provided a superior fit to the linear model ($\Delta\chi^2$ = 29.9, df = 1, p < .001), explaining an additional 15% of within-team variance. Overall, linear time accounted for 84% of within-team (over time) variation and quadratic time 86% compared to the unconditional means model. Note that a significant quadratic change implies that the rate of change changes from year to year. Upon examining each team's performance trajectory I found that many teams' curve followed a delayed growth trajectory. After speaking with the course instructors and considering the nature of the simulation, it was clear that this pattern could be expected since it takes time to develop, manufacture and market the product before seeing returns on stock price. For this reason I begin by fitting a quadratic model. If this is significant I then examine the "instantaneous rate of change" or the linear time predictor at each point. This is not unlike examining the simple effects of variable A at multiple levels of variable B in the presence of an interaction.

Results for the substantive analyses are reported in Table 8. Hypotheses 1a, which posited that elaboration would positively affect performance trajectories, displayed a significant quadratic trend (Υ = 1.635 p = .001). When I examined the simple slopes or the instantaneous rate of change at each time, I found that elaboration predicted linear change starting at year 5. An analogous way to interpret this is to say that teams who elaborated more were set on better performance paths by year 5, supporting hypothesis 1a. These simple slopes are reported in Table 9. I depict these trajectories in Figure 3. Hypotheses 1b posited that elaboration would affect end-state performance. To test this, I used the "intercept-as-outcome" technique and centered the time measure at year 8. Teams who elaborated more performed better by the end of the simulation (Υ = 17.61 p = .001) supporting hypothesis 1b.

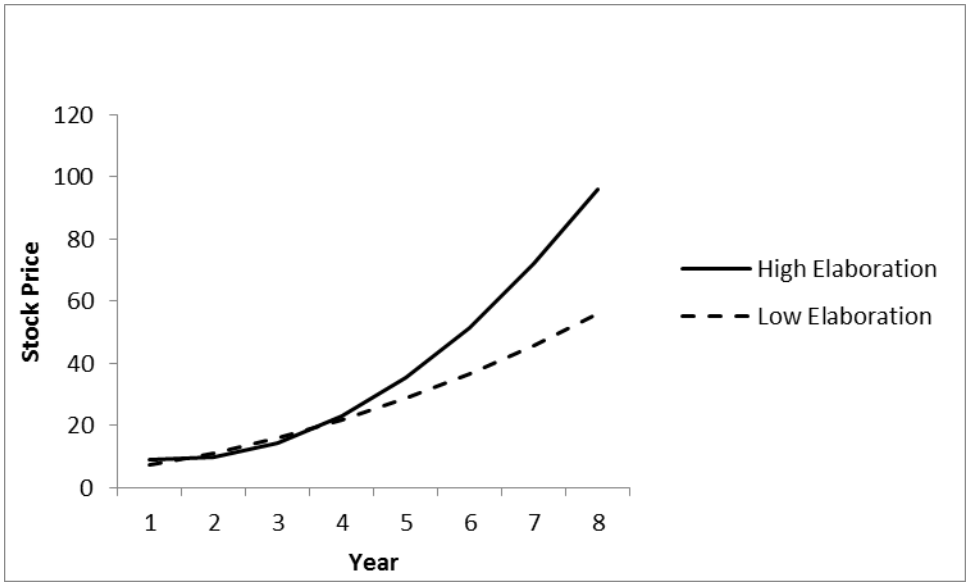

Figure 3. Performance Trajectories

Table 8

Elaboration on End-state Performance and Performance Trajectories

	Performance (Year = 8)	Quadratic Trajectory
Independent Variables		
Ethnic diversity	6.94	6.94
Gender diversity	-22.75*	-22.75*
GPA	-7.43	-7.43
Grad dummy	-4.3	-4.3
Team size	-0.18	-0.18
Elaboration	17.61***	1.635***

Note. N = 30 teams over 7 or 8 perfromance rounds.

* p < .05
** p <= .01
*** p <= .001

Table 9

Elaboration on Yearly Instantaneous Rate of Change in Performance

	Elaboration	
Year	Coeff	Pval
1	-5.28	ns
2	-2.01	ns
3	1.26	ns
4	4.53	ns
5	7.80	0.06
6	11.06	0.01
7	14.34	<.01
8	17.61	<.01

Note. N = 30 teams over 7 or 8 perfromance rounds.

Discussion

The current study found that teams who elaborated early on grew at a faster rate and exhibited better end-state performance. I proposed that teams who elaborate develop better initial strategies and deeper understanding of the task. This enables teams, from the start, to move along a more optimal path and equips them with the flexibility to think at a high level when unforeseen events occur and the task needs to be re-conceptualized. Furthermore, when teams elaborate, they are more likely to develop a collective understandings of the goals and plans of the task (Ericksen & Dyer, 2004), leading to more efficient coordination of action (Cannon-Bowers, Salas, & Converse, 1993; Klimoski & Mohammed, 1994).

Implications

Theoretical and Practical Implications and Future Directions

The current study adds to our understanding of the long term payoffs of elaborating early on. Teams that elaborated early on grew exponentially as small advantages early on were used to garner even more advantages. This idea is echoed in what Hackman (1990) called "self-fueling spiral" (pp. 481) in which "the rich [get] richer and the poor [get] poorer" (pp. 481-484). Ericksen and Dyer (2004) noted that initial strategies that were better fitted to the environment gave teams "a constellation of key inner resources" (pp. 466) that eventually propelled teams towards a "virtuous path" of task accomplishment (pp. 457).

It is interesting that alternative trajectory patterns were not exhibited. We did not see a pattern in which early advantages were sustained at a constant rate (e.g. parallel lines) or whose value diminished over time (e.g. initial advantages disappeared over time). Elaboration is

therefore a team activity that pays dividend over time. Future research should investigate difference possible performance patterns. There are few theoretical models that specify which team processes or under what situation one would expect a diminishing, stable, or growth pattern.

Furthermore, future research should investigate more closely the proposed mechanisms through which elaboration early on translates to better performance. While I proposed several mechanisms, they are in need of more direct measurements. For instance, did teams who elaborated early on develop better initial strategies and deeper understanding of the task, and did these mechanisms in turn lead teams to handle unforeseen events more astutely? Or did elaborating early on, change the norms and expectations of team members such that it created a safe environment for learning and reflexivity (Edmondson, 1999; Schippers, Edmondson, & West, 2014). Specifically, Marks, Mathieu and Zaccaro's (2001) model of episodic performance where output from one episode becomes and input into the next episode may be especially useful to this end.

Practically speaking, research has shown that teams rarely engage in any discussion upfront. There is a natural urge to want to delve right in and start accomplishing components of the task because it gives members a sense of progress. Unless teams are explicitly told to do so, teams typically forego any discussion whatsoever (Hackman, Brousseau, & Weiss, 1976; Hackman & Wageman, 2005). Given this tendency and the present research that shows specifically the benefits of elaboration early on, one must consider ways to get teams to realize the importance of explicit discussions before starting the task. At this junction, leaders can block out a period of time to clarify task contents and talk about goals. Participatory meetings

(Ericksen & Dyer, 2004) may also be especially important as individual questions and uncertainties can be addressed.

Overall Discussions

In the 1st chapter of my dissertation I found that EI increased the ability of team members to elaborate and argued that this was because emotionally intelligent team members were better able to read others' emotional cues and thus respond effectively. Such team members could also manage their own emotions better which leads to an easier time collaboratively resolving differences. I found that this advantage translated into better performance in informationally heterogeneous teams because such teams had a higher need to elaborate. In the 2nd chapter of my dissertation I found that representational gaps—or fundamentally different lenses through which individuals conceived of organizational tasks decreases elaboration. Gaps can lead team members to misunderstand each other, weigh information differently, and use different vocabularies which decrease the ability of members to understand each other and thus render elaboration less efficient. The last chapter of my dissertation takes a longitudinal lens and examines how elaboration affects teams over time. I find that teams who elaborate early on grow not only linearly, but exponentially over time.

The starting point for the current analysis is that teamwork requires higher coordination costs. Given these higher cost (energy, time, money) it seems sensible to examine what processes enable them to outperform individuals. One of the main predictors of performance in knowledge-based teams is the way that information is exchanged and integrated (Hinsz et al., 1997). For this reason my dissertation has focused on information elaboration—or the depth with which members can exchange and integrate information. Despite the centrality of elaboration in

performance, teams suffer from barriers to communication. For instance, it can be emotionally threatening to listen to a perspective that diverges from one's own (de Dreu & van Knippenberg, 2005; Yang & Mossholder, 2004) and teams sometimes do not possess enough common ground to make sense of each other's ideas (Dougherty, 1992). The purpose of my dissertation is to unpack the emotional and cognitive barriers that teams may face in the process of elaboration. Doing so can accomplish two related goals. First, we can begin to theoretically make sense of the mechanisms that barricade successful communication. This echoes researchers' call for the need to take a process-oriented focus on teamwork (Lawrence, 1997; Pelled et al., 1999). Doing this accomplishes a second goal, and that is, to offer managers a set of toolkits to mitigate the damage of these barriers.

Doing so speaks to the performance of heterogeneous and homogeneous teams alike. Some have argued that information elaboration may be especially important in informationally diverse teams (Brodbeck et al., 2007). Informationally diverse teams hold more unique information—therefore aspects of the task that is relevant for performance but only held by a subset of the members. This implies that if this information is not exchanged, others will not have access to it and thus not be able to use it towards task accomplishment. Furthermore, members of informationally diverse teams are more likely to occupy different "thought worlds" (Dougherty, 1992) and need to take special effort to explicate the context in which this information or point of view is embedded in.

However, research outside of the diversity literature suggests that elaboration is important in all knowledge-based teams (e.g. Gardner, Gino, & Staats, 2012; Ericksen & Dyer, 2004; Woolley, 2009). Since the "fuzzy" tasks (Campbell, 1988) that such teams must solve have multiple paths to accomplishments and multiple goals to balance—teams must collectively

navigate this murky terrain. Under this situation, the task is complex enough that elaborating—whether in homogeneous or diverse settings—should lead to new insight and deeper task understanding. Because of its complexity, aspects of the task may not be obvious at first, and members need to think through it to arrive at an optimal solution. Furthermore, there is rarely a truly homogeneous situation that would render elaboration useless. Even when teammates have comparable education majors and functional areas, they are not going to have taken all the same classes, read the same materials, participated in the same projects, and so on. Furthermore, given that different people pay attention to different stimuli (Kunda, 1999), certain cognitions will be different. Individuals also have different perspectives and thinking styles. What this implies is that while there might be seemingly large overlaps in homogeneous teams, there should still be enough differentiation for the potential of synergy in teams that elaborate (e.g. sparking creativity, informing others of task relevant information, forcing members to explore assumptions, leading to a deeper understanding of the task, and so on).

Lastly, besides utilizing individual members' cognitions and elaboration to arrive at the optimal solution, creating a shared understanding of the task is imperative (Ensley & Pearce, 2001). In most complex tasks, there will be an almost infinite number of paths that can be taken to accomplish the project, and getting all team members on board with the specific way that the task will be accomplished is important. Take, for instance, the non-routine task of designing a website for a client—even if team members have similar training (e.g. went to the same design school), explicitly elaborating what the website will look like and creating a shared understanding of the end goal and a plan on how to arrive there is crucial for high performance (Ericksen & Dyer, 2004). Research has found, consistently (regardless of diversity levels), that teams who elaborate create a deeper understanding of the task and shared vision about the end-

product (Amason, 1996; see Kellermanns et al., 2011). This enables teams to make more optimal decisions, deal with unforeseen events more successfully, and create better implementation plans (see Kellermanns et al., 2011).What this pattern points to is that elaboration is important in both diverse and homogeneous teams.

In sum, given the importance of elaboration in knowledge based teams, the increased reliance of such teams in organizations, and the fact that teams can suffer emotional and cognitive barriers to elaboration, the present research offers managers a set of toolkits that increases the chance that teams will overcome these barriers. Spending the effort to do this early on is imperative for the sustained performance of teams over the long term.

APPENDIX

Appendix A

Scoring of Information Elaboration

A score of 1 was given when an item was mentioned only in the context of ranking it, without any elaboration. A score of 2 was given when an item was mentioned and at least one other member reacted to it (e.g. by nodding or saying "OK"). A score of 3 was given when an item was mentioned and at least one other member asked a question about it or made a follow up comment, but no synthesis or judgment of the information or item was made. A score of 4 was given when, in addition to what is needed to get a score of 3, team members made a conclusion about the importance of the item. A score of 5 was given when, in addition to what is needed to get a score of 3, team members synthesized one other piece of information with the current item under discussion. A score of 6 was given when, in addition to what is needed to get a score of 3, team members synthesized two or more pieces of information with the current item under discussion. A score of 7 was given when, in addition to what is needed to get a score of 5 or 6, team members made a conclusion about the importance of the item.

Appendix B

Representational Gap Task

The recent Healthcare Reform intends to make the purchase of health insurance mandatory in 2014 and impose a penalty on those who do not purchase it. The premise for this plan is to make healthcare more widely available and affordable. However, the government recognizes that there are groups of people who may need special and different considerations. The government wants to lay out a plan that clearly denotes what is to be done, if anything, with these groups of people.

Imagine that you are a member on a team of policy analysts working for the "Healthcare Leadership Council." The Advisory Board at your organization has asked that your team create a plan of action for individuals who may have financial difficulty purchasing the mandatory health insurance in 2014.

The Advisory Board has specifically asked that you create a memo to lay out what role the government should play in subsidizing 3 particular groups—1) individuals / households below a certain income level, 2) the elderly, and 3) Non US citizens. In this case, a subsidy means that the government will give a lump sum of money that can only be used towards the purchase of health insurance.

To simulate real world budget constraints, your team will be endowed with 90 points that are meant to act as your "federal budget." You and your teammates will decide how you are to distribute the 90 points between the 3 groups. You cannot exceed 90 points, but you do not have to use all your points.

For each of these groups you and your teammates will firstly decide whether any subsidy should be given. If your team does decide to award a number of points larger than 0 to a group, you will come up with a rubrics for how individuals *within* the category should be compensated. For example, in the case of the elderly, your team will decide such things as whether all the elderly should be subsidized equally, or whether there are some criteria that make certain elderly individuals receive a higher / lower subsidy (e.g. those with higher income are subsidized less). Please be as comprehensive and thorough as possible on this part. Finally, and most importantly, your team and you will write a rationale for *why* you have chosen or chosen not to subsidize each group. If you have chosen to subsidize a group, your rationale should also include why you have chosen to distribute the subsidy in a particular way (i.e. why are all elderly individuals being subsidized equally?).

Your memo will NOT be judged on your decision to subsidize or not subsidize any particular groups. You will only be judged on the rationale that you give for your decisions. It is thus important that your memo lays out the rationale for *why* you are making the choices that you do. That is, you should explain *why* you are making these recommendations to the Advisory Board.

Appendix C

Representational Gap Measure

Poverty Line

(1) Middle and working class individuals should receive health insurance subsidies.

(2) Individuals at or below the poverty line should receive health insurance subsidies.

(3) The government should not make health insurance subsidy decisions based on income level.

The Elderly

(4) All elderly individuals should receive health insurance subsidies.

(5) Elderly individuals should receive health insurance subsidies only if they fall below a certain income level.

(6) The government should not make health insurance subsidy decisions based on age.

Non US Citizens

(7) Non US citizens should be eligible for the same health insurance subsidies as US citizens.

(8) Non US citizens should be eligible for some, but not all of the health insurance subsidies available to US citizens.

(9) Non US citizens should not be eligible for any health insurance subsidies from the government.

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