

Type of Diversity and Subgroup Formation: Implications for Team Composition

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ABSTRACT

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The group faultline model (Lau & Murnighan, 1998, 2005) suggests that strong faultline groups, in which individuals within a group share several diversity characteristics with one another and not with other members, will lead to greater ingroup/outgroup perceptions than weaker faultline groups, in which all group members share some diversity characteristics and differ on others. Recent research has supported this model at the group level (Lau & Murnighan, 2005; Sawyer et al., 2006; Thatcher et al., 2003). In order to advance this line of research, it is necessary to understand why these differences occur. Discovering where ingroup/outgroup relationships exist within the group is the first step in understanding why faultlines may disrupt group processes. Dyadic level measures of subgroup perceptions (trust and conflict) between individuals differing on nationality and functionality in strong and weaker faultline conditions were

collected. Dyadic differences were found based on the demographic context of the group, the number of shared characteristics, and a combination of the two.

However, not all dyads exhibited the expected relationships. Differences due to the demographic context of the group, the number of shared diversity characteristics, and the types of diversity characteristics shared are explored as possible reasons why some dyadic relationships, but not others, exhibited the expected ingroup/outgroup relationships.

1. Introduction

Toward the end of the 20th century and continuing into the new millennium, the business world has seen one of the most dramatic changes since the Industrial Revolution. The advents of the personal computer and the Internet have spawned enormous change in all areas of business. These advances in technology have connected diverse arrays of people, technology, and goods like never before.

Diversity within the workplace is increasing as technological innovations such as email, text chat, video and phone conferencing have made it easier than ever before to communicate across organizations and even nations. Access to diverse opinions allows for a greater number of perspectives to be considered and can result in innovation resulting from a wider range of perspectives, more quality solutions (Hoffman & Maier, 1961; McLeod & Lobel, 1992; Watson, Kumar, & Micaelson, 1993), and more creative problem-solving (McGrath, 1984; Shaw, 1981).

However, greater diversity also comes with its costs. Heterogeneous groups experience lower cohesion (O'Reilly, Caldwell, & Barnett, 1989), greater dissatisfaction and turnover (Jackson et al., 1991; Wagner, Pfeffer, & O'Reilly, 1984), less interpersonal liking and communication, and increased conflict (Jehn, 1995; Tsui & O'Reilly, 1989; Williams & O'Reilly, 1998). Obviously the diversity literature has found mixed results as to its impact on group outcomes.

One variable with the potential to explain some of these discrepant findings is the type of diversity present within the group. Two of the most researched diversity variables are demographic characteristics and functional diversity. Demographic diversity has been found to create greater personal (relationship) conflict, detracting attention from the task; while functional diversity has been found to enhance conflict regarding the task itself, leading to an improved understanding of the task (Alagana, Reddy, & Collins, 1982; Pelled, 1996; Pelled, Eisenhardt, & Xin, 1999; Jehn, Chadwick, & Thatcher, 1997).

While individual diversity variables have been studied, recent theory and research suggest that combinations of diversity variables may have the greatest effect on team processes and outcomes (Lau & Murnighan, 1998; 2005). When combining diversity variables that are expected to lead to different processes and outcomes individually, understanding when these combinations will lead to positive or negative outcomes becomes more important.

The group faultline model discusses how combinations of variables can lead either to the formation of subgroups or to a common group identity (Lau & Murnighan, 1998; 2005). This model suggests that the alignment of diversity variables within the group and the salience of these differences create subgroups, or faultlines, in a group. Faultlines have the potential to create an ingroup/outgroup effect between group members.

The faultline literature to this point has mostly concentrated on measuring faultline strength, or the empirical likelihood that diversity variables could align to create faultlines (Shaw, 2004; Thatcher, Jehn, & Zanutto, 2003). See Trezzini (2008) for a

thorough discussion of the strengths and weaknesses of each of these indices. Much of this work has been field research, focusing on the impact of faultline strength on various team processes and outcomes in working groups (e.g., Lau & Murnighan, 2005; Thatcherr et al., 2003). This research has mostly supported the fact that stronger faultlines disrupt group processes more than weaker faultlines (Lau & Murnighan, 2005; Li & Hambrick, 2005; Thatcherr et al., 2003).

In order to advance the faultline research, the process by which strong faultlines inhibit group processes must be better understood. Recent research has begun to focus on perceptions of subgroups rather than assuming faultline strength will always lead to certain outcomes (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008). Measuring perceptions of faultlines is one key to understanding how faultlines impact the group. The next step to understanding why faultlines affect the group is to uncover where the differences occur within the group.

Previous faultline research has mostly measured faultlines at the group level while often proposing opposite relationships at the dyadic level. For instance, group members in a strong faultline condition will likely exhibit very different relationships when interacting with similar than dissimilar group members. However, measuring relationships at the group level masks these nuanced relationships and has been cited as a reason for unexpected findings in the literature (Lau & Murnighan, 2005).

This study attempts to address the level of measurement issue by measuring perceptions at the dyadic level. Measuring relationships at the group level may mask underlying intra-group relationships. In an effort to more fully understand the process by

which faultlines may mitigate group functioning, this study begins by examining which dyadic relationships exhibit stronger and weaker bonds.

Another important element of the faultline process that has mostly been ignored is the timing of faultline formation. The group faultline model is based on social categorization theory, suggesting that ingroups and outgroups will form early in a group's development based on easily identifiable characteristics (Tajfel & Turner, 1986). If such characteristics lead to early subgroup perceptions, these early impressions may have a lasting impact on the group. However, because much of the faultline research has been conducted in the field, research has generally not been able to measure faultline formation from the group's inception (with the notable exception of Zellmer-Bruhn et al., 2008). If the process behind faultline formation is to be fully understood, it is important to determine if ingroup/outgroup perceptions are detected prior to interaction or if they only develop over time with interaction between group members.

The current study provides several contributions to the faultline literature. Relationships were measured at the dyadic rather than group level to tease apart ingroup-outgroup interactions from ingroup-ingroup interactions. The impact of these potential faultlines on processes of trust and conflict were examined. The timing of faultline formation is another key addition of this research. The study examines subgroups prior to and after interaction to understand when subgroups form.

1.1 Group Faultlines

Faultlines have the potential to divide group members into subgroups when diversity exists within the group and when these differences are perceived between

individuals within the group. The strength of the faultline is dependent on the number of salient individual attributes, their alignment, and the number of potential homogeneous subgroups (Lau & Murnighan, 1998). This suggests that an ingroup/outgroup effect is more likely when groups consist of several distinct homogeneous subgroups. For example, a group composed of three members who are young, male, and Caucasian, and three members who are older, female, and Hispanic are more likely to divide into subgroups than a group consisting of three members who are all male but of different ages and races, and three members who are all female but of different ages and races.

Faultlines are most often discussed in terms of demographic diversity (Lau & Murnighan, 1998; 2005), and nationality is one of the most salient demographic diversity variables (Earley & Mosakowski, 2000; Hambrick, Davison, Snell, & Snow, 1998). National diversity is defined by country of birth, but the distinctions lie much deeper as it may involve differences in ethnicity, language, and culture.

However, Lau and Murnighan (1998) also point out that faultlines can form based on other salient factors, such as differences in functional background. Functional diversity refers to differences in job and educational backgrounds. An example of functional diversity would be a sales team working with a marketing team. These team members bring distinct backgrounds, terminology, and viewpoints stemming from educational and job-related experiences in their particular field and these differences have the potential to create subgroups. Functional background is a possibly divisive characteristic, as individuals from different educational and career fields may bring very unique approaches to the same problem.

While diversity characteristics are often used as the measure of faultlines, Lau and Murnighan (1998) stress the fact that individual perceptions, not the faultlines themselves, determine whether subgroups are formed. External factors have an impact on whether individuals focus on the faultlines or create a shared identity. Thus, the group faultline model suggests that the same alignment of diversity characteristics does not have the same impact on all groups.

1.1.1 Faultline Strength. Strength of the faultline has been found to impact group processes and outcomes. Strong faultlines occur when diversity characteristics converge within subgroups and differ across subgroups, creating homogeneous subgroups. To the degree that characteristics cut across the group, faultline strength weakens. For example, a young Caucasian male, an older Caucasian female, and a young African American female would represent a weaker faultline condition. While these group members have characteristics in common, they each have characteristics that set them apart from other group members.

To the degree that diversity characteristics cut across the group rather than align, subgroup identities are less likely to be salient (Marcus-Newhall, Miller, Holtz, & Brewer, 1993). Sawyer, Houlette, & Yeagley (2006) found that cross-cutting faultline groups identified more with their group members, felt they had a greater opportunity to influence other group members, experienced more effective group processes, and performed better than strong faultline groups.

On the other hand, strong faultlines are detrimental to group outcomes. Strong faultlines have been found to produce lower levels of learning (Gibson & Vermeulen,

2003), performance, and morale (Thatcherr, Jehn, & Zanutto, 2003) than groups with weaker faultlines. These faultlines may also trigger negative communication and conflict as communication has been found to be less beneficial for strong faultline groups (Lau & Murnighan, 2005).

1.2 Why Subgroups Form

The diversity literature has increasingly focused on group faultlines in studying diversity within teams. However, researchers must first understand how diversity variables create subgroups. Social categorization theory has been widely proposed as an explanation for why diversity may create an ingroup/outgroup effect (Turner, 1975).

1.2.1 Social Categorization Theory. Social categorization theory is based on social identity theory, which states that individuals classify themselves and others into social categories based on demographic or informational characteristics (Tajfel & Turner, 1986). Social categorization occurs both for uncertainty reduction and self-enhancement purposes (Hogg & Terry, 2000). By categorizing oneself and others into categories, the world is simplified, allowing an individual to place him or herself in certain groups, while also distinguishing oneself from other groups (Ashforth & Mael, 1989; Riordan, 2000). Individuals are motivated to align themselves with groups that enhance their self-esteem (Hogg & Terry, 2000).

The ingroup/outgroup effect created by social categorization can divide teams into subgroups as it affects both the degree to which individuals communicate with outgroup members as well as attitudes and behaviors toward outgroup members. When subgroups become salient, individuals perceive greater differences between themselves and

outgroup members (Loden & Rosener, 1991) and focus more on these subgroup categories than the team as a unified entity (Tajfel, 1981). The focus on subgroups detracts from identification with the team as a whole (Park & Rothbart, 1982). As subgroup members form stronger identities with one another than outgroup members, these individuals interact more within subgroup than across subgroups, reducing cohesion and interaction throughout the team (Dreachslin et al., 2000; Hogg & Terry, 2000).

The ingroup/outgroup effect also impacts attitudes and behavior toward perceived outgroup members. Individuals are more biased toward their ingroup (Tajfel & Turner, 1986) and are more influenced by information from ingroup members (Abrams et al., 1990). Research has found that categorization leads to greater stereotypes, prejudice, polarization, and anxiety (Williams & O'Reilly, 1998) as well as less trust, cooperation, and expectations for success of outgroup members (Brewer, 1979; Tajfel, 1982).

Negative attitudes and behavior toward outgroup members result as these individuals are depersonalized (Hogg & Terry, 2000). Depersonalization of outgroup members as prototypes of the group, rather than being viewed as unique individuals, leads to stereotypes, prejudice, and reduced trust (Hogg & Terry, 2000). By depersonalizing these individuals, it makes it easier to produce antinormative behavior toward outgroup members.

Social categorization suggests that ingroup/outgroup perceptions are formed early based on easily identifiable characteristics. However, depersonalization of outgroup members also makes it easier and more acceptable to act in a hostile manner toward these individuals, suggesting ingroups and outgroups may also develop over time from hostile

interaction. Social categorization not only leaves the question of when subgroups form but also the group processes (trust, conflict) that are affected. The current study addresses both of these questions in the context of group faultlines.

2. Hypotheses

2.1 Trust

Past research has found that group members in strong faultline conditions are more likely to exhibit ingroup/outgroup perceptions than group members in weaker faultline conditions (Sawyer et al., 2005). In addition, ingroup members have been found to be less trusting of outgroup members (Brewer, 1979; Tajfel, 1982). Therefore, trust is expected to be reduced to a greater extent in strong faultline conditions with strong subgroup perceptions.

Research suggests that trust arises from familiarity, repeated communication among team members, and a shared identity (Jarvenpaa & Leidner, 1999). However, as strong faultlines develop there is less likelihood that these teams will be familiar, communicate often or have a shared identity (Lau & Murnighan, 1998; Lau & Murnighan, 2005; Sawyer et al., 2005). Therefore, in strong faultline groups, subgroup perceptions are expected to divide group members and these ingroup/outgroup perceptions will likely reduce trust between ingroup and outgroup members.

However, strong faultline conditions will not uniformly lead to less trust as dyadic relationships within the group are expected to exhibit different patterns of behavior. In a strong faultline condition some dyads will share several characteristics and other dyads will share none. Dyads sharing more characteristics in a strong faultline

condition should exhibit a strong ingroup relationship while dyads with few shared characteristics in a strong faultline condition will likely exhibit more of an outgroup relationship.

On the other hand, just interacting in a strong versus weaker faultline condition will also likely lead to dyadic differences. Group interaction creates a synergy which shapes the way dyads interact within a group setting. A dyad with certain characteristics in a strong faultline condition will interact differently than a dyad with those same characteristics in a weaker faultline condition. It is expected that dyads sharing no characteristics in a stronger faultline condition will exhibit less trust than dyads sharing no characteristics in a weaker faultline condition due entirely to the fact that members within the group share more characteristics in a weaker faultline condition.

Hypothesis 1: Dyads in which members differ on national and functional attributes will exhibit lower levels of trust when nested within stronger versus weaker faultline groups.

2.2 Conflict

Conflict is one of the most widely proposed and studied mediators of the diversity-outcome relationship (e.g., Earley & Mosakowski, 2000; Jehn, Northcraft, & Neale, 1999; Li & Hambrick, 2005; Mohammed & Angell, 2004). The literature has distinguished between two types of conflict, one task-based and the other interpersonal, or relationship conflict (Jehn, 1992).

The presence of an ingroup/outgroup effect breeds competition between groups (Tajfel & Turner, 1986). In addition, outgroup members are depersonalized as prototypes

of the outgroup rather than viewed as individuals (Hogg & Terry, 2000). Wilder (1984) suggests that while differentiation of ingroup members creates liking and acceptance, depersonalization of outgroup members creates hostility. In fact, depersonalization of outgroup members has been linked to justification of antinormative behavior toward these individuals (Hogg & Terry, 2000). Tajfel (1981) even suggests that one of the motives for stereotyping outgroup members is to justify one's actions toward this group. Thus, depersonalization of outgroup members makes it easier to act in a hostile manner toward these individuals.

The faultline literature supports the idea that stronger faultlines (with a greater ingroup/outgroup effect) will lead to relationship conflict. Li and Hambrick (2005), in a study of factional groups, found that stronger faultlines led to greater relationship conflict. Similarly, Thatcher, Jehn, and Zanutto (2003) found an inverted U-shaped relationship between faultline strength and relationship conflict. Specifically, they found that stronger faultline groups exhibited greater relationship conflict than medium (weaker in this case) faultline or no faultline groups. Therefore, the evidence suggests that stronger faultlines will result in greater relationship conflict.

Hypothesis 2: Dyads in which members differ on national and functional attributes will exhibit greater levels of relationship conflict when nested within stronger versus weaker faultline groups.

The ingroup/outgroup effect will also likely lead to task conflict. Ingroup members are more biased toward information from fellow ingroup members than information from outgroup members (Tajfel & Turner, 1986). Thus differences on how to

approach and complete the task will likely lead to further separation between ingroup and outgroup members. This has been supported in faultline literature as Li and Hambrick (2005) found that stronger faultlines led to greater task conflict.

Hypothesis 3: Dyads in which members differ on national and functional attributes will exhibit greater levels of task conflict when nested within stronger versus weaker faultline groups.

3. Method

3.1 Participants

One hundred and fifty undergraduate students from a large Mid-Atlantic university participated in this study. Participants were divided into 50 teams of three members each, 26 in the strong and 24 in the weaker faultline condition. Students were recruited from both the Psychology department and the Business School. Course credit is given for research participation in both the Psychology department and Business school, thus all participants were granted course credit in exchange for their participation in this study.

Participants were recruited based on national origin and college class; the characteristics underlying the diversity conditions. National origin consisted of those born in the United States and those born outside of the United States. The university from which students were selected is one of the most diverse in the nation, providing a great representation of minority participants from diverse backgrounds.

Course for which they were participating was used as a proxy for college major and was limited to Psychology or Business courses. For Business course members, 95% reported being a Business major and none of these individuals were Psychology majors. For the Psychology course individuals, 34% were Psychology majors and 21% were Business majors. In addition, participants from business courses were significantly more

likely to have previous business experience ($r = .70, p < .01$) as measured by experience working in business, taking business classes, and using Excel and PowerPoint.

3.1.1 Strong Faultline Condition. The strong faultline condition contained both national and functional diversity between group members. However, the group members were divided such that one dyad shared both nationality and functionality while the other two dyads shared neither characteristic. Therefore, this group consisted of two participants born in the U.S. and taking a Business class and one foreign born participant taking a Psychology class. See Appendix B for the demographic breakdown of the strong faultline condition.

3.1.2 Weaker Faultline Condition. The weaker faultline condition consisted of two U.S. born and one foreign born participant as well as two students in Business classes and one student in a Psychology class. However, the diversity characteristics cross-cut the subgroups. The make-up of the group was as follows: one U.S. born participant taking a Business class, one U.S. born participant taking a Psychology class, and one foreign born participant taking a Psychology class. See Appendix B for the demographic breakdown of the weaker faultline condition.

3.2 Procedure and Tasks

Prior to entering the study, participants filled out an online questionnaire to provide background demographics regarding gender, age, race/ethnicity, country of origin, first language learned, major, and the class for which they were completing the research. Upon entering the lab, participants were divided into groups of three and placed into separate rooms, interacting only via synchronous (instant messenger) text chat.

Participants were only provided information regarding country of origin and the class for which their team members were participating in the research. The minimal group effect suggests that by identifying members as belonging to different social groups, an ingroup/outgroup effect will be invoked (Tajfel, Billig, Bundy, & Flament, 1971), a finding that has been replicated in many subsequent studies (e.g., Diehl, 1988; Gaertner & Insko, 2000; Hertel & Kerr, 2001).

After providing information about their partners, the experimenter explained the first task to the participants. However, prior to beginning the first task, participants filled out measures of trust at the dyadic level. This provided information regarding baseline ingroup/outgroup effects, stemming solely from demographic information. Further measures of ingroups/outgroups were assessed following the task to find out how they changed after interaction.

Participants next performed one of two tasks and subsequent rounds of measures followed the task. These measures included those questions asked in the baseline as well as a process measure of conflict. After completing the measures following the task, participants were debriefed to complete the study.

3.2.1 Tasks. Groups randomly completed one of two different tasks. One task was an interdependent intellectual task involving a business scenario and thus triggering functional diversity. Interdependent intellectual or ‘hidden profile’ tasks have a right/wrong answer and require information from all participants in order to reach a solution (McGrath, 1984; Stasser & Stewart, 1992; Stasser & Titus, 1985). The other task was a judgment task involving a cultural misunderstanding that should trigger national

diversity. Judgment tasks have no right or wrong answer; instead group members must discuss the scenario and reach a consensus regarding appropriate action.

The intellective task was the ‘Alpha’ (Pfizer), ‘Beta’ (Proctor & Gamble), and ‘Gamma’ (Phillip Morris) task (Hollingshead, 1996). Each participant was given six shared pieces of information and two unique pieces of information for each company. The shared information portrayed Beta as the least attractive company, while combining all information (both shared and unique) lead to the conclusion that Beta was the most attractive company. See Appendix G for instructions and Appendix H for task information. Hollingshead pilot tested the study by providing participants with all of the information and 12 out of 15 individuals and an expert all picked Beta as the most attractive company.

Prior to the intellective task, group members were told that the task involved concepts learned in business courses in order to prime functional diversity between Psychology and Business students. The participants were not told that they received different information and all three participants worked together to complete the task. Groups were given 20 minutes and asked to reach a consensus and rank order the companies from most to least attractive. One group member was randomly chosen to record the group’s decision.

The judgment task involved a true scenario involving the assimilation of a Muslim family from Iraq into the United States. However, in order to protect against possible stereotypes and prejudice, the home country was changed to a fictional nation and the religion of the family was not discussed. See Appendix I for instructions and

Appendix J for the task. Group members discussed the case and were instructed to reach a consensus on two questions: 1) who was at fault and 2) how to resolve the issue.

Each participant was first given 10 minutes to read over the case and write down his or her initial opinions. Next, groups were given 20 minutes to discuss the case and reach a consensus regarding the questions. However, each participant wrote down the group's decision, leaving room for disagreement between group members. While group members were instructed to reach a consensus if possible, they were told that they could deviate from the group if no consensus was reached.

3.3 Measures

3.3.1 Demographics. Gender, age, GPA, SAT, year in school, race/ethnicity, country of birth, first language learned, familiarity with teammates and technology were measured. See Appendix L for items.

3.3.3 Trust. The adaptation of McAllister's (1995) measure of affect-based, cognition-based, and monitoring/defensiveness trust by Wilson, Straus, & McEvily (2006) was used to measure trust. Affect-based trust stems from emotional ties between group members while cognition-based trust deals with one's confidence in group members to perform the task effectively. Monitoring/defensiveness refers to the degree that group members must pay extra attention to the work of other group members. Wilson et al. (2006) adapted McAllister's (1995) original measure to work with short-term groups and thus these items were used. The measure was also adapted from the group to the individual level in order to compare trust of ingroup members to trust of outgroup members. Responses were recorded on a five-point scale ranging from "Strongly

Disagree” to “Strongly Agree.” Alpha for all dyadic averages of the trust items was .75 prior to interaction and .86 after interaction. See Appendix L for items.

3.3.6 Conflict. An adaptation of Jehn’s (1995) measure of task and relationship conflict was used to assess conflict. The measure includes eight items, four measuring task conflict and four measuring relationship conflict. Each item was measured on a five-point scale ranging from “None” to “A Great Deal.” These scales were adapted to the individual level to assess conflict between each group member. Alpha for all dyadic averages was .85 for relationship conflict and .88 for task conflict. See Appendix L for items.

4. Results

4.1 Faultline Analyses

Analyses were examined at both the group and dyadic level. Previous research has measured faultlines at the group level, ignoring relationships between dyads in the group. Group level analyses were conducted as a comparison to previous research but did not support any of the hypotheses. However, the current study was more interested in testing analyses at the dyadic level. Dyadic level analyses point to where the subgroups actually lie within the group. Measuring these variables at the group level may mask the true interactions between group members.

In both the strong and weaker faultline conditions, three group members worked together on the tasks. There are three dyadic relationships in the strong faultline condition, one sharing nationality and functionality and the other two sharing neither nationality nor functionality. There are also three dyadic relationships in the weaker faultline condition, one sharing nationality only, one sharing functionality only, and the other sharing neither nationality nor functionality. Dyads will be described in this manner (See Appendix B for demographic breakdown of the groups).

Due to the makeup of the groups, both the demographic context of the group and the number of shared characteristics vary between groups. Differences in the demographic context of the group are due exclusively to the makeup of the group. For

example, two group members not sharing any characteristics may view each other differently if all group members differ than if they share characteristics with other group members. However, dyadic differences may also be due to the number of shared characteristics between the dyad. Sharing two diversity characteristics may lead to stronger ingroup perceptions than sharing no characteristics regardless of the makeup of the remaining group members. In order to fully address these differences three sets of analyses were conducted to test each hypothesis.

First, the impact of only the demographic context of the group was examined while holding the number of shared characteristics constant. The impact of the demographic context of the group was tested by comparing differences between dyads sharing neither nationality nor functionality in either condition. These dyads provide the truest unique test of the effect of the demographic context of the group because any differences between conditions can only be attributed to the composition of the group, rather than demographic differences between the dyad members. If the group context impacts subgroup formation then stronger ingroup reactions between dyads sharing neither nationality nor functionality would be expected in the weaker than stronger faultline condition.

Second, differences between the number of shared characteristics were tested, while holding the demographic context of the group constant. In the strong faultline condition, it was expected that dyads sharing both nationality and functionality would exhibit stronger ingroup reactions than dyads sharing neither nationality nor functionality because they share two versus zero diversity characteristics. In the weaker faultline

condition dyads sharing nationality only and dyads sharing functionality only were expected to exhibit greater ingroup relationships than dyads sharing neither nationality nor functionality because they share one versus zero diversity characteristics.

Finally, dyads that differed in the number of shared characteristics as well as faultline strength were examined. Two dyadic relationships were examined for this set of tests. First, dyads that shared nationality and functionality in a strong faultline condition were expected to experience greater ingroup perceptions than group members sharing only nationality in a weaker faultline condition because they share more characteristics in common and are partnered with a third group member whose characteristics are opposite in nature, heightening the perception of an ingroup-outgroup difference. If dyads sharing fewer characteristics are expected to exhibit stronger outgroup perceptions, then it also makes sense that dyads sharing more characteristics should exhibit stronger ingroup perceptions. In order for strong outgroup perceptions to be present, group members sharing more characteristics in a strong faultline condition would also have to exhibit strong ingroup perceptions.

The other dyadic comparison across conditions and number of shared characteristics was between dyads sharing one characteristic in the weaker faultline condition and dyads sharing no characteristics in the strong faultline condition. Dyads sharing functionality only in the weaker faultline condition were expected to exhibit greater ingroup relationships than dyads sharing neither characteristic in the strong faultline condition due both to sharing more characteristics and to the weaker ingroup/outgroup dynamic within the group. Both sharing more characteristics and

operating in a weaker faultline condition were expected to lead to greater ingroup perceptions.

Perceptions between each pair of group members was averaged to the dyadic level and all analyses compare the dyadic averages. Analyses were examined at two time periods (whenever possible); prior to any interaction and after the task. Approximately half of the groups received the business task and half the cultural task in each condition.

4.2 Hypothesis Testing

Means and standard errors for all study variables are provided in Appendix A. Age was found to be significantly and positively related to conflict and was therefore included as a covariate for analyses involving the conflict measures. The inclusion of task type as a covariate did not change any of the results and thus this covariate was dropped from the final analyses.

4.2.1 Demographic Context of the Group. First, the impact of the demographic context of the group holding the number of shared characteristics constant was tested by examining dyads that did not share nationality or functionality in either the strong or weaker faultline condition. Differences in this dyadic relationship between conditions can only be attributed to the faultline conditions. It was expected that while these dyads do not share national or functional diversity in either condition, the strong faultline condition would create a greater barrier between group members sharing no characteristics than would a weaker faultline condition in which all group members share at least one characteristic with another group member.

Hypothesis 1 stated that dyads in which members differ on national and functional attributes will exhibit lower levels of trust when nested within strong versus weaker faultline groups. Univariate ANOVAs were run to test dyadic differences between conditions (Appendix A, Table 1).

Prior to the first task, there was a significant difference in levels of trust between conditions for dyads sharing neither nationality nor functionality ($F = 4.34$, partial $\eta^2 = 0.08$, $p < .05$) with dyads in the strong faultline condition ($M = 3.50$, $SE = 0.06$) exhibiting less trust than dyads in the weaker faultline condition ($M = 3.32$, $SE = 0.06$). However, after interacting on the task, there was no significant difference in trust ($F = 0.36$, partial $\eta^2 = 0.01$, *ns*) between dyads in the strong ($M = 3.58$, $SE = 0.11$) versus weaker faultline groups ($M = 3.68$, $SE = 0.11$). These results support hypothesis 1 prior to interaction, as trust was lower between dyads sharing no characteristics in the strong faultline groups than weaker faultline groups. However, this relationship did not hold up after group members began interacting.

Hypothesis 2 stated that dyads in which members differ on national and functional attributes will exhibit greater levels of relationship conflict when nested within strong versus weaker faultline groups. Univariate ANCOVAs, with age as a covariate, were run to test dyadic differences between conditions (Appendix A, Table 1). Holding age constant, there was no significant difference in relationship conflict ($F = 0.02$, partial $\eta^2 = 0.00$, *ns*) between dyads in strong ($M = 1.49$, $SE = 0.15$) versus weaker faultline groups ($M = 1.52$, $SE = 0.16$). Differences due to the demographic context of the group did not

support the hypotheses of greater relationship conflict in strong than weaker faultline groups.

Hypothesis 3 stated that dyads in which members differ on national and functional attributes will exhibit greater levels of task conflict when nested within strong versus weaker faultline groups. Univariate ANCOVAs, with age as a covariate, were run to test dyadic differences between conditions (Appendix A, Table 1). Holding age constant, there was no significant difference in task conflict ($F = 0.74$, partial $\eta^2 = 0.02$, *ns*) between dyads in strong ($M = 2.08$, $SE = 0.19$) versus weaker faultline groups ($M = 1.85$, $SE = 0.19$). Differences due to the demographic context of the group did not support the hypotheses of greater task conflict in strong than weaker faultline groups.

4.2.2 Number of Shared Characteristics. The group faultline hypothesis also suggests that sharing more characteristics will lead to a greater ingroup/outgroup relationship than sharing fewer characteristics (Lau & Murnighan, 1998). Paired sample t-tests were run to test the effect of the number of shared characteristics on ingroup/outgroup relations, holding the demographic context of the group constant.

Three dyadic pairs were compared to test for the effects of the number of shared characteristics. In the strong faultline groups, dyads sharing both nationality and functionality were compared to dyads sharing neither. In the weaker faultline groups, dyads sharing neither characteristic were compared to both dyads sharing nationality and dyads sharing functionality.

For the first test of the impact of the number of shared characteristics, dyads sharing both nationality and functionality were expected to exhibit greater ingroup

relationships than dyads sharing neither nationality nor functionality in the strong faultline condition (Appendix A, Table 2). Prior to the first task there were no significant differences in trust between dyads sharing neither nationality nor functionality and dyads sharing both characteristics in a strong faultline condition ($t = 1.69$, $df = 25$, *ns*). However, after interacting on the task, dyads sharing neither nationality nor functionality exhibited less trust than dyads sharing both nationality and functionality ($t = 2.06$, $df = 25$, $p < .05$). Therefore, sharing fewer characteristics in a strong faultline condition did lead to less trust but only after some interaction between group members.

There were no significant differences in relationship conflict between dyads sharing neither nationality nor functionality and dyads sharing both characteristics in a strong faultline condition when holding age constant ($t = -1.96$, $df = 25$, *ns*). However, there was a significant difference in task conflict with dyads sharing neither nationality nor functionality exhibiting greater task conflict than dyads sharing both characteristics when holding age constant ($t = -2.84$, $df = 25$, $p < .01$). Therefore, hypothesis 3, but not hypothesis 2, was supported when comparing dyads that shared both nationality and functionality to dyads that shared neither in a stronger faultline condition.

For the second test of the impact of the number of shared characteristics, dyads sharing nationality were expected to exhibit greater ingroup relationships than dyads sharing neither nationality nor functionality in the weaker faultline condition (Appendix A, Table 3). Dyads sharing nationality only did not significantly differ on trust with dyads sharing neither nationality nor functionality in the weaker faultline condition prior to ($t = -0.19$, $df = 23$, *ns*) or after interaction on the task ($t = 0.33$, $df = 23$, *ns*). Sharing

nationality also did not lead to less relationship ($t = -0.59$, $df = 23$, *ns*) or task conflict ($t = 0.45$, $df = 23$, *ns*) as compared to dyads sharing no characteristics in a weaker faultline condition when holding age constant. Therefore, hypotheses were not supported when dyads shared only nationality as compared to sharing no characteristics.

For the third test of the impact of the number of shared characteristics, dyads sharing functionality were expected to exhibit greater ingroup relationships than dyads sharing neither nationality nor functionality in the weaker faultline condition (Appendix A, Table 4). Dyads sharing functionality only did not significantly differ on trust with dyads sharing neither nationality nor functionality in the weaker faultline condition prior to ($t = -0.32$, $df = 23$, *ns*) or after interaction on the task ($t = -0.95$, $df = 23$, *ns*). Sharing functionality also did not lead to less relationship ($t = 0.00$, $df = 23$, *ns*) or task conflict ($t = -0.19$, $df = 23$, *ns*) as compared to dyads sharing no characteristics in a weaker faultline condition when holding age constant. Therefore, hypotheses were not supported when dyads shared only functionality as compared to sharing no characteristics.

4.2.3 Demographic Context and Number of Shared Characteristics. Finally, the effects of both the demographic context of the group and the number of shared characteristics were combined. In the first test, dyads sharing nationality and functionality in the strong faultline condition were expected to exhibit greater ingroup relationships than dyads sharing only nationality in the weaker faultline condition. Univariate ANOVAs were run to test dyadic differences in trust between conditions (Appendix A, Table 5). Trust did not significantly differ between dyads sharing nationality and functionality in a strong faultline condition ($M = 3.46$, $SE = 0.06$) and

dyads sharing only nationality in a weaker faultline condition ($M = 3.48$, $SE = 0.06$) prior to interaction ($F = 0.07$, partial $\eta^2 = 0.00$, *ns*). Trust also did not significantly differ between dyads sharing nationality and functionality in a strong faultline condition ($M = 3.79$, $SE = 0.09$) and dyads sharing only nationality in a weaker faultline condition ($M = 3.73$, $SE = 0.09$) after interaction ($F = 0.21$, partial $\eta^2 = 0.00$, *ns*).

Univariate ANCOVAs, with age as a covariate, were run to test dyadic differences in relationship and task conflict between conditions (Appendix A, Table 5). When controlling for age, dyads sharing only nationality in a weaker faultline group ($M = 1.42$, $SE = 0.09$) exhibited significantly greater relationship conflict ($F = 5.72$, partial $\eta^2 = 0.11$, $p < .05$) than dyads sharing both nationality and functionality in a strong faultline group ($M = 1.11$, $SE = 0.09$). When controlling for age, dyads sharing only nationality in a weaker faultline group ($M = 2.00$, $SE = 0.16$) also exhibited significantly greater task conflict ($F = 7.57$, partial $\eta^2 = 0.14$, $p < .01$) than dyads sharing both nationality and functionality in a strong faultline group ($M = 1.38$, $SE = 0.16$). Therefore, while dyads sharing nationality only in a weaker faultline group did not exhibit less trust than dyads sharing both nationality and functionality in a strong faultline group, they did perceive greater conflict.

In the second test of the impact of differences on the demographic context and number of shared characteristics, dyads sharing functionality in the weaker faultline condition were expected to have greater ingroup relationships than dyads sharing no characteristics in the strong faultline condition (Appendix A, Table 6). Univariate ANOVAs were run to test dyadic differences in trust between conditions. Trust did not

significantly differ between dyads sharing functionality in a weaker faultline condition ($M = 3.47$, $SE = 0.06$) and dyads sharing no characteristics in a strong faultline condition ($M = 3.45$, $SE = 0.06$) prior to interaction ($F = 0.06$, partial $\eta^2 = 0.00$, *ns*). Trust also did not significantly differ between dyads sharing functionality in a weaker faultline condition ($M = 3.54$, $SE = 0.11$) and dyads sharing no characteristics in a strong faultline condition ($M = 3.65$, $SE = 0.11$) after interaction ($F = 0.56$, partial $\eta^2 = 0.01$, *ns*).

Univariate ANCOVAs, with age as a covariate, were run to test dyadic differences in relationship and task conflict between conditions (Appendix A, Table 6). When controlling for age, dyads sharing only functionality in a weaker faultline group ($M = 1.52$, $SE = 0.12$) did not significantly differ in relationship conflict ($F = 0.07$, partial $\eta^2 = 0.00$, *ns*) from dyads sharing no characteristics in a strong faultline group ($M = 1.48$, $SE = 0.12$). When controlling for age, dyads sharing only functionality in a weaker faultline group ($M = 1.82$, $SE = 0.18$) did not significantly differ in task conflict ($F = 0.09$, partial $\eta^2 = 0.00$, *ns*) from dyads sharing no characteristics in a strong faultline group ($M = 1.89$, $SE = 0.17$). Therefore dyads sharing functionality in a weaker faultline group did not exhibit greater trust or less conflict than dyads sharing no characteristics in a strong faultline group.

5. Discussion

The diversity field has experienced a shift away from a focus on individual diversity characteristics toward an alignment approach, where multiple diversity characteristics are studied at once, due to the popularity of Lau and Murnighan's (1998; 2005) group faultline model. The current study measured perceptions of group members differing on national and functional diversity at the dyadic level. Dyadic ingroup/outgroup perceptions differed based on the composition of the group and the number of shared characteristics but not all dyadic relationships exhibited the expected ingroup/outgroup dynamics.

Previous faultline research has found that weaker faultline groups exhibit less conflict (Lau & Murnighan, 2005; Li & Hambrick, 2005; Thatcher et al., 2003) as well as greater identification and performance (Sawyer et al., 2006; Thatcher et al., 2003) than strong faultline groups. However, most of these studies have measured outcomes at the group level and have been conducted in the field with little to no control over the number of group members and the types of diversity variables dividing group members. They also have not, for the most part, studied how subgroups may have formed in the first place.

While the first step in testing the group faultline model was to determine whether strong faultlines lead to worse outcomes, the next step in this line of research is to find

out how this process works. Recent research has taken a step in the right direction by beginning to measure perceptions of diversity differences between group members rather than at the group level (Zellmer-Bruhn et al., 2008). However, in order to address how faultlines break apart the group, researchers must first determine where these differences occur within the group. Only by truly understanding the underlying group dynamics is it possible to fully understand how the alignment of diversity characteristics impacts the group.

Lau and Murnighan's (2005) findings point out the dangers of measuring faultlines at the group level. They found that strong faultline groups reported less relationship conflict. However, they suggest that this finding may be caused by more positive perceptions between ingroup members in the strong faultline condition.

Perceptions of whether a fellow group member belongs to one's ingroup or an outgroup occur at the dyadic level and measuring outcomes at the group level may mask the true relationships in a group. For example, when relying on self-report measures, group members asked about their perceptions of group trust may indicate high trust with the group, when in fact they are only referring to other members of their ingroup. However, these group members may have low trust with outgroup members. Measuring trust at the group level will not capture the differences in perceptions of trust between ingroup and outgroup members. Only by measuring relationships at the dyadic level will researchers be able to truly understand where ingroups and outgroups are forming within the group and how these divisions impact group processes.

The current study provides several key contributions to the literature. First, trust and conflict are measured at the dyadic rather than group level. In addition, the virtual nature of the interaction allowed for the manipulation of only national and functional diversity, reducing the chances that subgroup perceptions were influenced by other diversity variables. Finally, this study controlled for the number of group members in each condition with three in each group, eliminating the power structure of the group as a possible additional factor influencing group dynamics.

None of the relationships were significant at the group level, but examining relationships at the dyadic level provides some interesting results. These findings provide further support for the idea that relationships should be measured at the dyadic level when studying group faultlines. However, while measuring relationships at the dyadic level presents a clearer picture of where ingroups and outgroups are forming within the group, it also presents some challenges. The biggest challenge of measuring dyadic relationships in group faultline research is determining why differences occur. There are three possible explanations for why dyads may exhibit greater ingroup or outgroup perceptions in this study.

The first reason dyads may exhibit ingroup or outgroup perceptions is due strictly to the demographic context of the group. The composition of the rest of the group may affect how one group member views another. For example, two group members sharing no characteristics may exhibit stronger ingroup perceptions when they both share characteristics with other group members than when one of them shares no characteristics with the rest of the group.

Another reason for stronger ingroup or outgroup perceptions between dyads is the number of shared diversity characteristics. Sharing more diversity characteristics with one group member than another may lead to greater ingroup perceptions with this member regardless of the demographic context of the rest of the group. That is, each dyad may identify more or less with one another based strictly on differences with the individual; the makeup of the rest of the group may not matter.

Finally, the type of diversity variables that dyad members share may impact whether an individual is perceived as an ingroup or outgroup member. Some diversity variables may be more salient or may run deeper, leading to strong outgroup perceptions with this group member regardless of the number of shared variables or the makeup of the rest of the group. For example, if group members are unable to communicate due to language or cultural differences, sharing age, gender, and functionality may not matter.

In the current study the type of diversity that varied between conditions was not manipulated, only functionality changed. Therefore, type of diversity was not tested. However, analyses did focus on the demographic context of the group, the number of shared characteristics, and a combination of both of these variables.

The purest test of the effect of demographic context of the group was between dyads that did not share nationality or functionality in either condition. In this case, any dyadic differences between conditions would be attributed solely to the demographic context of the group. In the weaker faultline condition, the third group member shares one characteristic with each group member and was expected to act as a bridge between the group members who shared no characteristics. In the strong faultline condition, the

third group member shares only characteristics with one member, and is thus seen as an ally of this group member but in opposition to the other member who shares neither nationality nor functionality with either group member.

The demographic context of the group was found to impact perceptions of trust prior to interaction, as dyads sharing no characteristics reported greater trust in the weaker faultline condition. However, no differences in trust or conflict were found after the group interacted on the task. This finding may suggest that the demographic context of the group has the greatest impact on group members' perceptions of the team prior to interacting but more research is needed before any firm conclusions can be drawn.

The number of shared characteristics also seemed to have an impact on ingroup/outgroup perceptions. The number of shared characteristics only seemed to matter, however, when sharing two characteristics versus none in the strong faultline condition. In the strong faultline condition, dyads sharing nationality and functionality had greater trust and less task conflict after interacting on the task than dyads sharing neither characteristic. On the other hand, when dyads shared only nationality or only functionality in the weaker faultline condition, they exhibited no differences from dyads sharing no characteristics.

There are several possible explanations for why differences in the number of shared characteristics between dyads only sometimes mattered. It is possible that ingroup perceptions are stronger when sharing more characteristics, in this case two versus one. Another possibility is that the demographic context of the group could account for these differences. Sharing more characteristics may lead to greater ingroup perceptions only in

strong faultline conditions. Because the tests of the number of shared characteristics were nested within condition, it is impossible to tease apart the effects of the demographic context of the group from the number of shared characteristics in this study.

Evidence of an ingroup/outgroup effect was also found when both the demographic context of the group and the number of shared diversity variables were manipulated. Dyads sharing both nationality and functionality in a strong faultline group were expected to exhibit stronger ingroup perceptions than dyads sharing only nationality in a weaker faultline group. The expected relationships were supported in this study.

Dyads sharing both nationality and functionality in the strong faultline condition perceived less relationship and task conflict than dyads sharing only nationality in the weaker faultline condition. This finding was expected because in addition to sharing both nationality and functionality in the strong faultline condition, these group members also differed on both characteristics from the third member. Both sharing fewer characteristics than the strong faultline condition and not having a distinct outgroup member were expected to lead to greater conflict between dyads sharing only nationality in a weaker faultline condition

On the other hand, dyads sharing no characteristics in strong faultline groups were expected to exhibit less ingroup perceptions than dyads sharing functionality in the weaker faultline groups. The expected findings between dyads sharing no characteristics in a strong faultline condition, in which one dyad member had a strong ally with which he/she shared both nationality and functionality, and dyads sharing functionality in a

weaker faultline condition, however, were not supported. No significant differences for trust or conflict between these dyads were confirmed.

The question arises as to why the expected ingroup/outgroup perceptions were found for some dyads but not others. The three explanations for why dyadic relationships may differ also apply in this case. The expected ingroup in the strong faultline condition shared both nationality and functionality. As compared to dyads sharing no characteristics in the strong faultline condition, the ingroup tested in the weaker faultline condition (sharing functionality only) differed from the expected ingroup in the strong faultline condition based on the demographic context of the group, the number of shared characteristics (1 versus 2), and the variables shared (functionality versus nationality and functionality).

The expected ingroup between dyads sharing both nationality and functionality was nested within the strong faultline condition. The similarity between group members contrasted with the lack of any shared characteristics with the outgroup member may have led to stronger ingroup reactions. The fact that all group members shared at least one characteristic in common with one other group member in the weaker faultline condition may have dulled any strong outgroup perceptions within this group.

The difference in the number of shared characteristics between the dyads is another possible explanation for the differences in the findings. Stronger ingroups may form when sharing two characteristics than when sharing only one or none. This would support Lau and Murnighan's (1998) assertion that the number of diversity variables dividing group members has an impact on whether faultlines are activated. Dyads sharing

two characteristics (national and functional diversity) were found to exhibit less conflict than dyads sharing only one (functional diversity). However, no differences were found between dyads sharing one characteristic (functional diversity) versus none. This conclusion would suggest that the more diversity variables that group members share with the ingroup and differ on with the outgroup, the stronger the ingroup/outgroup relationship.

A third explanation is that the type of diversity characteristics present in the group may play a role in whether ingroup/outgroup perceptions are formed. Ingroup perceptions were not found between group members differing on national diversity even when dyads shared functionality. In this case the national diversity difference may be stronger than a functional diversity similarity.

Nationality has been suggested to be a superordinate diversity characteristic (Earley & Mosakowski, 2000). Earley and Mosakowski suggest that nationality will be most salient because it not only affects the way one communicates (Geringer, 1988) but also is at the top of one's trait hierarchy (Turner, 1985). Basically, differences in nationality can shape how one thinks about race, gender, work, and other demographic characteristics.

If superordinate diversity characteristics exist, then the impact of diversity characteristics on the group may differ based on their salience. This conclusion suggests that strong and weaker faultlines do not uniformly lead to certain outcomes; rather the types of characteristics dividing group members may determine whether ingroup/outgroup relationships are formed or not. If this is the case, researchers must take

the type of diversity into account and measure individual perceptions of subgroups when conducting faultline research. However, the current study did not test each of these scenarios, so these explanations should be met with caution.

5.1 Implications for Practice

Diversity is a fact of life in 21st century work teams. Diversity within the group has the possibility to broaden the perspective of the group and improve innovation (e.g., Hoffman & Maier, 1961; McLeod & Lobel, 1992; Watson et al., 1993) if it does not first divide the group. Managers must learn how to most effectively integrate group members from very diverse backgrounds to take advantage of diversity rather than allowing it to divide the group.

This study found that in some instances ingroup/outgroup perceptions formed prior to interaction, based on limited knowledge of their partners, suggesting that social categorization and initial stereotypes can create an initial ingroup/outgroup effect. Hostile interactions and conflict between ingroup and outgroup members may perpetuate subgroups but may not always be the root cause. While more research is needed to study the effects of initial impressions over time, the current study does suggest that subgroups may form very early, possibly even before the group officially commences.

Knowing that ingroup/outgroup perceptions form even prior to interaction is important to the strategies for group formation. Without ever seeing or interacting with other group members, subgroups formed based on available characteristics of group members. This is not very different from real-world groups that likely have access to information regarding new group members' gender, race, ethnicity, and job function prior

to actually meeting the person. This information can come directly from a conversation with a manager or others in the organization or indirectly through such means as email correspondence or résumés.

Previous group faultline research has mostly ignored the timing of subgroup formation. The fact that subgroups formed prior to interaction based on salient surface-level characteristics means that managers assembling a diverse group must take precautions against an ingroup/outgroup effect very early on, even prior to any group interaction. While subgroups may change after interaction based on deep-level diversity characteristics, surface-level diversity must be accounted for and dealt with prior to group formation.

Several steps may be taken to combat the formation of subgroups based on surface-level diversity prior to interaction. First, managers need to move quickly to combat stereotypes and build a strong team identity. Providing more information about future group members than their age, race, gender, and position in the company will reduce the reliance on one or two surface-level characteristics when forming early impressions of an individual. In addition, social meetings between team members at the onset of the group's development and team-building exercises may be easily implemented methods to overcome early subgroup formation. Zellmer-Bruhn et al. (2008) also suggest setting the focus on the group level by emphasizing group goals and incentives.

Conflict did arise between subgroup members in some instances in the study. If interactions become hostile, managers must focus on different aspects of group

development. In this case, managers need to make sure that communication is as effective as possible. Team members should be trained to share contextual information when relevant, ensure messages are received and understood, and communicate in a 'lingua franca', or common language, whenever possible (Cramton, 2002). Ensuring that team members understand one another and are on the same page is the first method to combat hostile communication. In sum, early stereotypes can be mitigated by providing more contextual information about group members, setting aside time for socialization early in the group's development, and setting group goals. On the other hand, avoiding conflict may require developing a lingua franca and greater expression of cultural and social cues.

5.2 Limitations and Future Directions

The goal of the current study was to determine whether ingroup/outgroup perceptions differ within the group and where these difference lie. This study was not setup to explicitly test why these differences occur. Therefore, future research needs to explore why these dyadic differences exist. Several explanations for dyadic differences in subgroup perceptions were discussed in this paper including group differences due to the demographic context of the group, and dyadic differences due to the number of shared characteristics or the types of shared characteristics.

There were dyadic differences both within and between conditions, however, the study is unable to address whether these differences are due to the demographic context of the group, the number of shared characteristics, or the type of characteristics shared. Future research should test all of these possibilities. In order to determine whether differences are due to the demographic context of the group, the number of diversity

variables shared, or the types of diversity variables dividing the group, all of these variables would have to be manipulated within the same study.

If ingroup/outgroup relationships are found more often in groups with strong faultlines regardless of the number of shared characteristics or the type of characteristics present, this would suggest the demographic context of the group is causing subgroup formation. If subgroup differences are present in conditions with the same number of shared characteristics regardless of the demographic context of the group or the diversity variables they share, this would suggest that the number of shared characteristics has the greatest impact on subgroup formation. On the other hand, if certain diversity characteristics lead to subgroup formation regardless of the demographic context of the group or the number of shared characteristics, this would suggest type of diversity is having the biggest influence on subgroup formation.

All of these explanations may be true in certain instances. It may be true that in some cases, such as groups with very strong racial or cultural ties, superordinate diversity characteristics exist that supersede all other faultlines. In other cases when all characteristics have roughly equal potential to divide group members, sharing several characteristics may lead to a stronger subgroup than sharing just one or two characteristics. Finally, the composition and alignment of diversity characteristics within the rest of the group may be the primary driver of whether an individual is viewed as an ingroup or outgroup member. However, the current study was not explicitly setup to test these conclusions.

As mentioned, this research was conducted in a laboratory setting with a student population performing in short-term groups. The limited time-span of the groups makes it difficult to study how the impact of diversity changes over time. On the other hand, an advantage of conducting lab research on faultlines is the ability to test when subgroups form and how they influence future interactions. As mentioned, most previous faultline studies have been conducted in the field; weeks, months, and sometimes years of interactions and personal histories have impacted the formation of subgroups beyond the initial diversity variables. Researchers must find out how diversity variables impact subgroup formation from the very beginning of the group's development and how these initial impressions impact interactions over time. Future research should attempt to bridge the gap between field and lab research by not only examining subgroup perceptions at the group's inception but also measuring how they change over time.

A real-world setting would also involve many more than two diversity variables and this would impact the results. However, one of the strengths of the current study is that it isolates diversity variables by not confounding them with social cues that may also impact subgroup formation, such as a person's dress, the way he/she speaks, his/her appearance and attractiveness, etc. Obviously social cues do impact groups in the real-world, making field research important. However, understanding the contributions of each diversity characteristic on its own in the lab is also important. If researchers do not know the impact of the variables individually, it will be impossible to tell which characteristics are impacting the group when examining them all at once.

Obviously field research and lab research serve two very different functions. When setting one's research goals, the strengths and weaknesses of both approaches should be kept in mind. These differences have led to a recent divide in the faultline research between studies conducted in the field and studies conducted in the lab. Field studies have for the most part focused on 'potential' faultlines, measuring their strength through various indices (Shaw, 2004; Thatcher et al., 2003; Trezzini, 2008).

However, identifying faultline strength is not enough, field researchers should also control for alignment of variables in the field, to the extent possible. Equating a group that has two racial majority members and one racial minority member with a group that has two racial minority members and one racial majority member leads to many difficulties. But that is precisely what occurs when researchers use the fault statistic or other methods of computing faultlines in the field. It becomes increasingly difficult to tell what is actually causing subgroups within teams with the addition of even more diversity variables.

On the other hand, lab research has begun to focus on how and why faultlines form by measuring diversity perceptions (Zellmer-Bruhn et al., 2008). This line of research is paramount to discovering the underlying processes behind the impact of faultlines. The ability to 'create' faultlines from scratch allows for the continued testing of the alignment and types of characteristics that lead to the strongest faultlines.

Two other areas for future research in the lab involve the power structure of the group and the role of the situation. Future research should continue to test different combinations of diversity characteristics within groups. Moving beyond two majority

members and one minority member, what happens when the minority racial or gender group members make up a majority within the group or when subgroups are evenly spread between majority and minority members? Research has proven that the power structure of the group has an effect on group interactions (Mackie, 1987; Nemeth, 1986), but what effect does it have on subgroup formation?

The situation should also be taken into account when studying faultlines. Student groups, such as the one studied in this research, are likely to have strong ties along college major or functional diversity. Group members differing on race or nationality may have stronger ties to their racial or national heritage in some cities or parts of the world than others. Therefore, it may be too simplistic to suggest that a diversity variable always impacts a group in the same manner. It may depend on the situation. Future research should aim to incorporate the effects of both the power structure and the situation into future research studies.

Appendix A. Means, Standard Errors, and Results of Study Variables

Table 1

Demographic Context of the Group

Dyads Sharing Neither Nationality nor Functionality	Strong Faultline Mean (SE)	Weaker Faultline Mean (SE)	F	df	Partial η^2
Trust Prior to Interaction	3.50 (0.06)	3.32 (0.06)	4.34*	1,48	0.08
Trust After Interaction	3.58 (0.11)	3.68 (0.11)	0.36	1,48	0.01
Relationship Conflict	1.49 (0.15)	1.52 (0.16)	0.02	1,46	0.00
Task Conflict	2.08 (0.19)	1.85 (0.19)	0.74	1,46	0.02

* $p < .05$

** $p < .01$

Table 2

Number of Shared Characteristics in Strong Faultline Groups: Sharing Nationality and Functionality Versus Sharing No Characteristics

	Sharing Nationality and Functionality Mean (SE)	Sharing No Characteristics Mean (SE)	t	df
Trust Prior to Interaction	3.46 (0.07)	3.32 (0.06)	1.69	25
Trust After Interaction	3.78 (0.09)	3.58 (0.09)	2.06*	25
Relationship Conflict	1.20 (0.09)	1.50 (0.12)	-1.96	25
Task Conflict	1.50 (0.13)	2.08 (0.18)	-2.84**	25

* $p < .05$

** $p < .01$

Table 3

Number of Shared Characteristics in Weaker Faultline Groups: Sharing Nationality Versus Sharing No Characteristics

	Sharing Nationality Mean (SE)	Sharing No Characteristics Mean (SE)	t	df
Trust Prior to Interaction	3.48 (0.05)	3.50 (0.06)	-0.19	23
Trust After Interaction	3.73 (0.10)	3.68 (0.13)	0.33	23
Relationship Conflict	1.41 (0.13)	1.52 (0.17)	-0.59	23
Task Conflict	1.97 (0.22)	1.86 (0.19)	0.45	23

* $p < .05$

** $p < .01$

Table 4

Number of Shared Characteristics in Weaker Faultline Groups: Sharing Functionality Versus Sharing No Characteristics

	Sharing Functionality Mean (SE)	Sharing No Characteristics Mean (SE)	t	df
Trust Prior to Interaction	3.47 (0.07)	3.50 (0.06)	-0.32	23
Trust After Interaction	3.54 (0.11)	3.68 (0.14)	-0.95	23
Relationship Conflict	1.52 (0.12)	1.52 (0.17)	0.00	23
Task Conflict	1.82 (0.16)	1.86 (0.19)	-0.19	23

* $p < .05$

** $p < .01$

Table 5

Demographic Context and Number of Shared Characteristics: Sharing Nationality and Functionality in Strong Faultline Groups Versus Sharing Nationality in Weaker Faultline Groups

	Sharing Nationality and Functionality in Strong Faultlines Mean (SE)	Sharing Nationality in Weaker Faultlines Mean (SE)	F	df	Partial η^2
Trust Prior to Interaction	3.46 (0.06)	3.48 (0.06)	0.07	1,48	0.00
Trust After Interaction	3.79 (0.09)	3.73 (0.09)	0.21	1,48	0.00
Relationship Conflict	1.11 (0.09)	1.42 (0.09)	5.72*	1,46	0.11
Task Conflict	1.38 (0.16)	2.00 (0.16)	7.57**	1,46	0.14

* $p < .05$

** $p < .01$

Table 6

Demographic Context and Number of Shared Characteristics: Sharing Functionality in Weaker Faultline Groups Versus Sharing No Characteristics in Strong Faultline Groups

	Sharing Functionality in Weaker Faultlines Mean (SE)	Sharing No Characteristics in Strong Faultlines Mean (SE)	F	df	Partial η^2
Trust Prior to Interaction	3.47 (0.06)	3.45 (0.06)	0.06	1,48	0.00
Trust After Interaction	3.54 (0.11)	3.65 (0.11)	0.56	1,48	0.01
Relationship Conflict	1.52 (0.12)	1.48 (0.12)	0.07	1,46	0.00
Task Conflict	1.82 (0.18)	1.89 (0.17)	0.09	1,46	0.00

* $p < .05$

** $p < .01$

Appendix B. Demographic Context by Condition

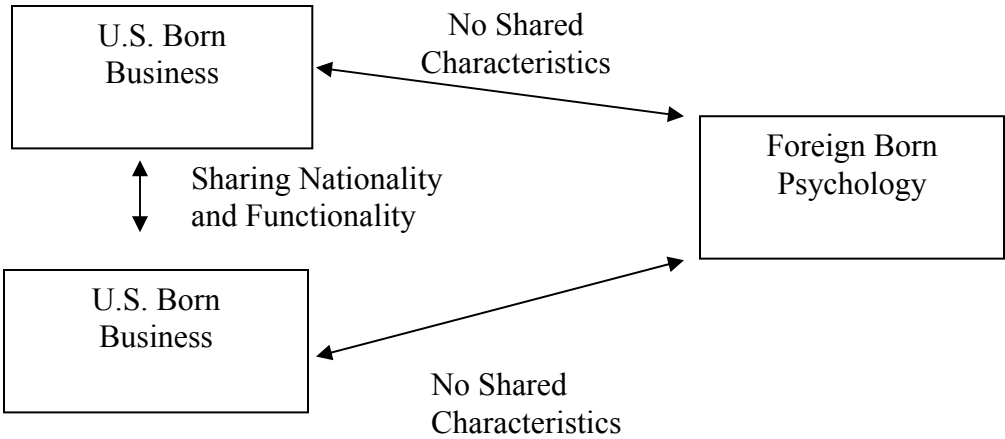


Figure 1. Demographic Context of Strong Faultline Condition.

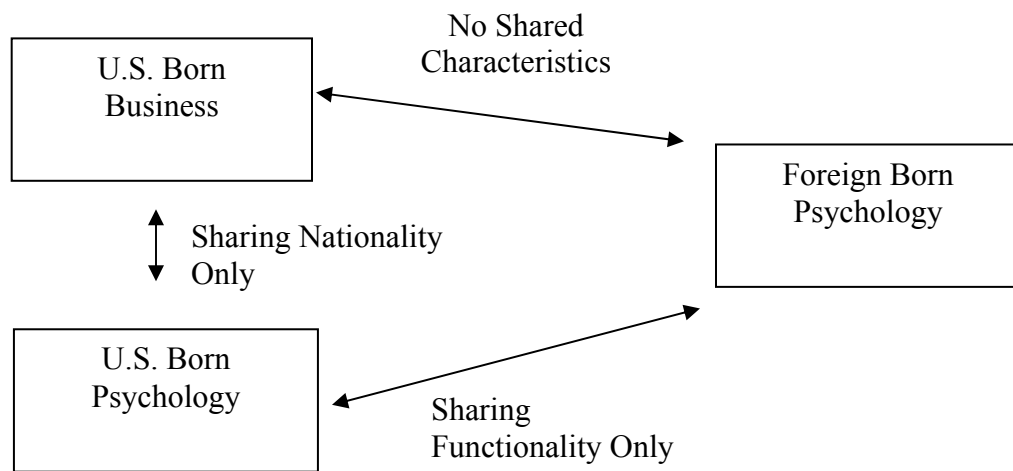


Figure 2. Demographic Context of Weaker Faultline Condition.

Appendix C. Diversity Literature

Research has found mixed support as to the effects of diversity on teams. On one hand, positive outcomes associated with heterogeneous teams include a wider range of perspectives, more quality solutions (Hoffman & Maier, 1961; McLeod & Lobel, 1992; Watson et al., 1993), and more creative problem-solving (McGrath, 1984; Shaw, 1981). However, heterogeneous teams also experience lower cohesion (O'Reilly, Caldwell, & Barnett, 1989), greater dissatisfaction and turnover (Jackson et al., 1991; Wagner, Pfeffer, & O'Reilly, 1984), less interpersonal liking and communication, and increased conflict (Jehn, 1995; Tsui & O'Reilly, 1989; Williams & O'Reilly, 1998). Further, a recent meta-analysis on diversity found no relationship between diversity and performance or cohesion (Webber & Donahue, 2001). In addition, this literature has been criticized for its lack of emphasis on theory and processes (Lawrence, 1997; Levine & Moreland, 1990; Pelled, 1996; Williams & O'Reilly, 1998). Obviously the jury is still out as to the impact of diversity on group processes and outcomes.

Two of the most researched diversity variables are demographic characteristics and skill-based diversity. These variables have been categorized as task-related versus non-task-related diversity (Pelled, Eisenhardt, & Xin, 1999), task-related versus relations-related diversity (Jackson, May, & Whitney, 1995), and demographic versus informational diversity (Sawyer, Houlette, & Yeagley, 2006). In addition, Pelled (1996) created two dimensions along which diversity characteristics fall; visibility and job-relatedness. Visibility refers to the salience of the characteristic and job-relatedness to the

degree that the characteristic impacts task performance. Because skill diversity is not always related to the group's task, the current study discusses these variables as demographic versus informational diversity.

National Diversity. National diversity is considered the most salient demographic diversity variable (Early & Mosakowski, 2000; Hambrick et al., 1998). National diversity is defined by country of birth, but the distinctions lie much deeper. National boundaries have an influence on the language, education, political system, media influences, and symbols to which one is exposed, all of which play a role in defining culture (Hofstede, 1980; Schwartz, 1999).

Having mentioned culture, this study does not specifically address questions stemming from cross-cultural research. Instead, the current study is interested in how differences in perceptions of national diversity impact impression formation and interaction with group members. The purpose of this study is not to compare cultures but rather to study the effect of perceived cultural differences as a whole on subgroups within diverse teams.

National Diversity and Relationship Conflict

Demographic diversity, including nationality, has a greater impact on the social climate than the performance of a team (Pelled, 1996; Sessa & Jackson, 1995). Therefore, demographic diversity should impact interpersonal relationships more than the task itself. In fact, research has shown that interpersonal, or relationship, conflict is triggered by visible demographic characteristics more than informational diversity (Alagana, Reddy, & Collins, 1982). In addition, a study specifically comparing the effect of demographic

diversity on relationship and task conflict found that demographic diversity is positively related to relationship conflict but negatively related to task conflict (Pelled, 1996).

Therefore, demographic diversity leads to more interpersonal (relationship) conflict but not the more positive task conflict. The question then is, why?

National diversity involves differences in cultures and languages that are expected to divide team members. These discrepancies are not based on knowledge of the task or ability to perform the task but on differences in values and beliefs as well as stereotypes. Therefore, discrepancies in nationally diverse groups will likely revolve around values, beliefs, and misunderstandings rather than how to perform the task. In fact, it has been found that nationally heterogeneous groups exhibit lower task conflict than nationally homogeneous groups (Thomas, Ravlin, & Wallace, 1996). The focus on values and beliefs rather than the task will likely draw communication away from the task and more toward social issues.

Researchers have distinguished between task-related and non-task-related communication (Jackson et al., 1993; Katz, 1982; Zenger & Lawrence, 1989). Task-related communication is directed toward issues of how to best perform the task, team processes, and other efforts to accomplish the task. Non-task related communication, on the other hand, involves issues that do not directly relate to the task, ranging from topics outside of work to interpersonal differences. Non-task related communication is a necessary but not sufficient condition for relationship conflict, as relationship conflict involves non-task related disagreements.

National diversity is expected to be positively related to relationship conflict because it will lead to more social than task communication. Relationship conflict is most often about non-work issues such as gossip and social events and may involve differences in beliefs and values (Jehn, 1995, 1997). Jehn (1995) suggests that relationship conflict manifests itself in tension, animosity, and annoyance between group members. Relationship conflict may involve swearing or arguing between group members that is unrelated to the task; instead disagreements stem from personal differences and non-task related issues.

Differences in culture and language cause groups to focus more on interpersonal aspects of the group than on the task itself (Evan, 1965), thus involving more non-task related communication. Therefore, national diversity will likely lead to a focus on non-task related issues, which will in turn lead to greater conflict regarding interpersonal issues, rather than the task itself.

Functional Diversity. Functional diversity refers to differences in job and educational backgrounds. An example of functional diversity would be a sales team working with a marketing team. These team members bring distinct backgrounds, terminology, and viewpoints stemming from educational and job-related experiences in their particular field and these differences have the potential to create subgroups.

Functional, or job-related diversity, has been found to impact team processes and performance (Pelled, 1996; Sessa & Jackson, 1995; Milliken & Martins, 1996). Positive results of functional diversity have been found indicating that it enhances firm innovation (Bantel & Jackson, 1989) and performance in new ventures (Roure & Keeley, 1990).

Ancona and Caldwell (1992), on the other hand, found that functional diversity not only had a negative direct relationship with performance and innovation but also an indirect positive relationship with innovation through communication with individuals outside of the group. The literature suggests that functional diversity may have a positive or negative overall impact on the team, depending on team processes (most likely the ability of the group to keep task conflict from degenerating into relationship conflict).

Functional diversity is often viewed as a deep-level diversity characteristic as it involves individual differences in education and training, however, it can also act as a surface-level diversity variable (Sawyer et al., 2005). Job function can be surface-level (Kramer, 1991) to the degree that an individual is seen as a member of the marketing department, sales department, technician, etc. Stereotypes often exist regarding educational background and job function that may initially create social categorization. This phenomenon is seen in a classic job function study (Strauss, 1964). The study, examining the relationship between purchasing agents and engineers, quoted one purchasing agent as saying, “Engineers are a special breed of cat that think they know everything, including purchasing.... They feel the purchasing agent is just a clerk” (p. 141). This quote, regarding the opinion of a purchasing agent about engineers, highlights the stereotypes that people often hold about individuals in certain job functions.

Functional Diversity and Task Conflict

Functional diversity has been linked to differences in opinion of how to best approach and perform the task at hand. Functional diversity involves differences in interests and mental scripts (Ancona, 1990). Dearborn and Simon (1958) found that even

when executives from different departments were given the same case to analyze, each identified the most important problem in terms of their own particular goals within the organization. Differences in education and functional background lead individuals to unique means of structuring and solving problems, even the same problem. Functionally diverse group members may bring unique views on how to look at the problem, best methods to accomplish the task, most effective means to work together, as well as differing views on the ultimate criterion to which group success is compared.

Therefore, the link between functional diversity and task conflict is not surprising (Pelled, 1996; Pelled, Eisenhardt, & Xin, 1999; Jehn, Chadwick, & Thatcher, 1997). For example, Jehn, Northcraft, and Neale (1999) found that informational diversity (differences in task knowledge, one potential division between job functions) positively impacted performance, and this relationship was mediated by task conflict. Jehn (1995) suggests that functional differences may manifest themselves in disagreements over viewpoints, ideas, and opinions, which may help to generate ideas and formulate more thought out plans.

Functional diversity is expected to lead to task conflict because it evokes greater task-related than social communication. Functional diversity has been linked to less informal communication and social integration (Glick, Miller, & Huber, 1993; O'Reilly et al., 1989; Smith et al., 1994). This suggests that functionally diverse groups do not spend much time socializing, but rather focus explicitly on the task. Research has also found that differences in educational background foster task-related debate (Jehn et al., 1997). Therefore, functional diversity is expected to lead to task conflict (Pelled, 1996;

Pelled et al., 1999; Jehn et al., 1997) because communication is focused on the task rather than social issues.

Appendix D. Group Faultline Research

Group Faultline Research. As group faultlines are a fairly new concept, research must establish that faultlines; 1) offer explanations of diversity outcomes that are not explained by traditional diversity research and that 2) alignment of diversity characteristics creates greater problems for groups than non-aligning heterogeneous groups or homogeneous diversity groups. To date, the few studies that have focused on group faultlines have provided solid support for the faultline approach.

Few studies have compared the faultline approach to traditional diversity research (examining the impact of heterogeneity individually for each characteristic). One such study conducted by Lau and Murnighan (2005) did find that the faultline approach explained more variance than single attribute conceptualizations of diversity on outcomes such as perceptions of team learning, psychological safety, satisfaction, and expected performance. Sawyer et al. (2006) further found that race as an individual variable was less important in predicting outcomes than faultline alignment. Therefore, early results suggest that the faultline conceptualization of diversity can explain group outcomes better than examining diversity characteristics individually.

Early research also supports the notion that strong faultlines disrupt group processes and outcomes. Research on faultlines has found that both strong and weak faultlines lead to lower levels of learning (Gibson & Vermeulen, 2003), performance, and morale (Thatcherr, Jehn, & Zanutto, 2003) than groups with weaker faultlines. Weak

faultline groups suffer from lack of diversity (e.g., less creativity and idea generation) in the case of a homogeneous group and a lack of common ground in the case of an extremely heterogeneous group, while strong faultlines will trigger negative communication and conflict (Lau & Murnighan, 2005). Earley and Mosakowski (2000) have come to the same conclusions with non-faultline diversity research, finding that moderate levels of heterogeneity lead to the worst performance (the group faultline approach proposes that moderate amounts of diversity will create the strongest faultlines).

More recent faultline research has also supported the group faultline model. Sawyer, Houlette, and Yeagley (2006) studied three-person groups with strong (aligning characteristics), moderate (cross-cutting characteristics) or no faultlines (homogeneous groups). The diversity characteristics they studied were race and job function (participants were given information regarding marketing of drugs or drug related facts). These group members then worked together to solve a hidden profile task, a highly interdependent task requiring input from all three group members (Stasser & Titus, 1985). Sawyer et al. (2006) found that cross-cutting faultline groups identified more with their group members, felt they had a greater opportunity to influence other group members, experienced more effective group processes, and performed better than the strong and no faultline groups. Surprisingly, no differences were found between the outcomes for the strong and no faultline groups.

However, Sawyer et al.'s (2006) study did have some limitations. First, their conceptualization of job function only focused on informational differences. While individuals from different backgrounds are likely to hold discrepant information, the

values, beliefs, and underlying psychological variables may have the biggest impact on whether subgroups form. For example, if Sally and Susan know different parts of the task than Lorie and Lisa, this is not likely to create a strong ingroup/outgroup effect. However, if Sally and Susan believe that their background as paramedics make their opinion more important than Lorie and Lisa's opinion as nurses, then an ingroup/outgroup effect may be more likely. In addition, while the researchers go to great lengths to compare communication between ingroup and outgroup members, their measures of group identification, opportunity to influence, and process effectiveness all were measured at the group level, limiting conclusions regarding the impact of subgroup formation on these variables.

Lau and Murnighan (2005) also studied differences between strong and weak faultline groups (their operationalization of weak faultlines included both cross-cutting and no faultline groups). Supporting their hypotheses, this study found that communication frequency was beneficial to psychological safety, satisfaction, and performance for groups in weak faultlines. However, communication frequency was not beneficial to these outcomes for groups with strong faultlines. The researchers propose that strong faultline groups will experience greater conflict in communication across subgroups than weak faultline groups. On the contrary, their study found that strong faultline groups actually experienced less relationship conflict, greater psychological safety, and greater satisfaction than weak faultline groups. The authors attempt to explain these counterintuitive findings by suggesting that participants in strong faultline groups

may have been thinking about similar others in the group (their subgroup) when filling out the questionnaires, rather outgroup members within the team.

Some design and methodological issues in previous research make it difficult to interpret their results. First, several studies did not control for the number of members in each group. A faultline consisting of two aligning group members and one minority member faces entirely different circumstances than a group in which the faultline is split 50/50 between four group members. Group dynamics and power tactics shift dramatically depending on the size of the majority group or whether subgroups are equivalent (Kabanoff, 1991; Lawler, 1986; 1993; Pfeffer, 1981). Both the number of members in the group and the distribution of ingroup and outgroup members will impact study results.

Perhaps just as problematic, process and outcome variables were measured via self-report measures, even number of communications and performance. Not only were the self-report measures an inaccurate measure of actual processes and outcomes (Lau and Murnighan (2005) found that expected performance correlated only .4 with an objective measure of performance that the authors explain they could not obtain for all groups), but using self-report for all measures creates a severe problem with method variance. Method variance artificially inflates relationships due only to the use of the same method of measurement, overestimating the actual relationship between variables.

Finally, and perhaps most importantly, questions have been asked at the group level, while focusing on relationships between subgroup members. For example, in the Lau & Murnighan (2005) study, the authors were unable to confirm whether participants were referring to satisfaction, communication, etc. between other ingroup members or

between the ingroup and outgroup members, making it very difficult to tease apart the impact of various faultline conditions on group processes and outcomes. The inability to measure interactions between ingroup as opposed to outgroup members has been a serious flaw of the faultline research to this date. Measuring variables at the group level may suggest positive overall outcomes due exclusively to ingroup interactions, while interactions between ingroup and outgroup members may be lost.

While early reports are supportive of Lau and Murnighan's (2005) model of group faultlines, obviously more research is needed. The faultline conceptualization has been found to improve upon the predictability of single attribute conceptualizations of diversity (Lau & Murnighan, 2005; Sawyer et al., 2005) and groups with weaker faultlines have been found to produce better outcomes than groups with strong or no faultlines (Gibson & Vermeulen, 2003; Lau & Murnighan, 2005; Sawyer et al., 2006; Thatcherr et al., 2003). However, most of these studies have some methodological issues and have not addressed questions regarding when faultlines form and how they disrupt group processes. More research is needed to test the impact of faultlines on communication channels and the disruption of other key processes in order to truly understand and combat the negative impact of group faultlines.

Appendix E. Hypotheses Not Included in Final Paper

2.3 Communication Frequency

To the extent that subgroup perceptions exist based on surface-level demographic variables, communication is expected to be limited between group members. Individuals prefer to interact with similar others (Byrne, 1971). This supports the social categorization literature, which has found that subgroup members interact more within the subgroup, reducing communication and cohesion in the group as a whole (Dreashlin et al., 2000; Hogg & Terry, 2000). As Sawyer et al. (2006) explain, "...subgroup boundaries generate beliefs and attitudes about insiders versus outsiders that can form a barrier to communication and collaboration."

Strong faultline groups are expected to exhibit a greater ingroup/outgroup relationship than weaker faultline groups. Based on social categorization theory, greater subgroup perceptions are expected to limit communication between ingroup and outgroup members (Dreashlin et al., 2000; Hogg & Terry, 2000).

Hypothesis 4: Dyads in which members differ on national and functional diversity will exhibit lower levels of communication frequency when nested within strong versus weaker faultline groups.

Interdependent tasks require communication and coordination between team members to reach effective performance standards (McGrath, 1984). These tasks cannot be solved by one group member; contributions are required of each group member in order to solve the problem. Therefore, to the degree that social categorization and

subgrouping disrupt communication channels, team members will not be able to perform effectively on an interdependent task.

Hypothesis 5: Strong subgroup perceptions will result in lower levels of performance on an interdependent task and this relationship will be mediated by communication frequency.

Communication Hostility. While subgroup perceptions are expected to reduce communication between ingroup and outgroup members, to the degree that they do interact, communication hostility may be the biggest problem created by a strong ingroup/outgroup effect. Lau and Murnighan (2005) propose that communication is the biggest driver of the success or failure of diverse groups.

Lau and Murnighan (2005) propose that a group with a strong identity is expected to communicate more positively, enabling a focus on the task rather than social problems. However, in strong faultline conditions, communication leads to conflict, resulting in poorer group performance. Strong faultlines will cause an ingroup/outgroup effect and subgroup members will be more likely to interact in a hostile manner and to interpret outgroup communications in a more hostile manner, further perpetuating existing barriers. While Lau and Murnighan (2005) proposed that communication would influence the degree to which conflict was present, they did not measure communication in their study, making it impossible for them to test their propositions.

The social categorization literature also suggests that attitudes and interactions between ingroup and outgroup members may be more hostile. Outgroup members are more likely to be viewed as prototypes of a group rather than as individuals (Hogg &

Terry, 2000). The depersonalization of outgroup members allows for greater stereotyping and prejudice (Williams & O'Reilly, 1998) and these attitudes make it easier to justify hostile communication toward outgroup members. Therefore, strong faultline groups will likely exhibit greater hostile communication than weaker faultline groups.

Hypothesis 6: Dyads in which members differ on national and functional diversity will exhibit greater levels of communication hostility when nested within strong versus weaker faultline groups.

Psychological Safety

Psychological safety is a “shared belief that the team is safe for interpersonal risk taking” (Edmondson, 1999, p. 354). In a psychologically safe environment, group members are able to share sensitive information and point out other team members’ mistakes without repercussion (Mayer, Davis, & Schoorman, 1995). This state is only realized through communication between group members (Edmondson, 1999). In groups with weaker subgroup perceptions, group members are expected to communicate more and foster a positive climate that will allow for the exchange of extreme ideas, even those that may run counter to other group members’ ideas. However, in groups with strong subgroup perceptions, psychological safety becomes more difficult. To the degree that group members do not communicate, communicate in a hostile manner, and do not trust one another, psychological safety will be mitigated.

Hypothesis 7: Dyads in which members differ on national and functional diversity will exhibit lower levels of psychological safety when nested within strong versus weaker faultline groups.

Appendix F. Results of Analyses Not Included in Final Paper

4.2.4 Communication Frequency. Hypothesis 4 stated that dyads in which members differ on national and functional attributes will exhibit lower communication frequency when nested within stronger versus weaker faultline groups. Univariate ANCOVAs, with age as a covariate, were run to test dyadic differences between conditions. Paired sample t-tests were run to test dyadic differences within condition.

First, communication frequency differences based on the demographic context of the group were tested. After interacting on the task, there were no significant differences in communication frequency ($F = 0.04$, partial $\eta^2 = 0.00$, *ns*) between dyads in strong ($M = 17.94$, $SE = 2.26$) versus weaker faultline groups ($M = 17.32$, $SE = 2.31$). These results do support hypothesis 4, as communication frequency did not differ between conditions based on the demographic context of the group.

Next, the impact of the number of shared characteristics on communication frequency was tested. In the strong faultline condition, dyads sharing both nationality and functionality were expected to exhibit greater communication frequency than dyads sharing neither nationality nor functionality. However, there were no significant differences in communication frequency between dyads sharing neither nationality nor functionality and dyads sharing both characteristics in a strong faultline condition when holding age constant ($t = -0.32$, $df = 22$, *ns*). Therefore, hypothesis 4 was not supported when comparing dyads that shared both nationality and functionality to dyads that shared neither in a strong faultline condition.

For the second test of the impact of the number of shared characteristics, dyads sharing nationality were expected to exhibit greater communication frequency than dyads sharing neither nationality nor functionality in the weaker faultline condition. Dyads sharing nationality only did not significantly differ on communication frequency with dyads sharing neither nationality nor functionality in the weaker faultline condition ($t = -0.38$, $df = 22$, *ns*). Therefore, hypothesis 4 was not supported when dyads shared only nationality as compared to sharing no characteristics.

For the third test of the impact of the number of shared characteristics, dyads sharing functionality were expected to exhibit greater communication frequency than dyads sharing neither nationality nor functionality in the weaker faultline condition. Dyads sharing functionality only did not significantly differ on communication frequency with dyads sharing neither nationality nor functionality in the weaker faultline condition ($t = 1.01$, $df = 21$, *ns*). Therefore, hypothesis 4 was not supported when dyads shared only functionality as compared to sharing no characteristics.

Finally, the effects of both the demographic context of the group and the number of shared characteristics were combined. In the first test, dyads sharing nationality and functionality in the strong faultline condition were expected to exhibit greater communication frequency than dyads sharing only nationality in the weaker faultline condition. However, when controlling for age, communication frequency did not significantly differ ($F = 0.03$, $\text{partial } \eta^2 = 0.00$, *ns*) between dyads sharing nationality and functionality in a strong faultline condition ($M = 16.83$, $SE = 1.94$) and dyads sharing only nationality in a weaker faultline condition ($M = 16.35$, $SE = 1.94$).

In the second test of the impact of differences on the demographic context and number of shared characteristics, dyads sharing functionality in the weaker faultline condition were expected to have greater communication frequency than dyads sharing no characteristics in the strong faultline condition. However, when controlling for age, communication frequency did not significantly differ ($F = 1.88$, partial $\eta^2 = 0.04$, *ns*) between dyads sharing functionality in a weaker faultline condition ($M = 17.48$, $SE = 1.62$) and dyads sharing no characteristics in a strong faultline condition ($M = 14.35$, $SE = 1.62$)

4.2.5 Performance. Hypothesis 5 proposed that when subgroup perceptions were present, performance would suffer on an interdependent task and that this relationship would be mediated by communication frequency. Identification with one's fellow group members was used as a measure of subgroup perceptions. Group level performance on the intellectual business task was regressed onto group level identification using multinomial logistic regression. Group level identification did not predict business task performance ($\chi^2 = 25.39$, Cox & Snell $R^2 = 0.51$, Nagelkerke $R^2 = 0.60$, *ns*). Therefore, hypothesis 5 was not supported.

4.2.6 Communication Hostility. Hypothesis 6 stated that dyads in which members differ on national and functional attributes will exhibit greater communication hostility when nested within strong versus weaker faultline groups. Due to the extremely low base rate of communication hostility (only a few instances were recorded for all groups), this hypothesis was unable to be tested.

4.2.7 Psychological Safety. Hypothesis 7 stated that dyads in which members differ on national and functional attributes will exhibit lower psychological safety when nested within strong versus weaker faultline groups. Group level univariate ANOVA's were used to analyze the data. However, no significant differences were found between conditions ($F = 0.08$, partial $\eta^2 = 0.00$, *ns*). Therefore, hypothesis 7 was not supported.

Appendix G. Intellectual Task Instructions

Please read the instructions with me as I read them out loud. This task involves concepts learned in Business courses. I have given each of you three sheets of paper describing three different companies: Alpha, Beta, and Gamma. Each company has a description of its products at the top, followed by eight pieces of information for each company. Your job is to work together with your partners to rank order the companies from 1 to 3 based on which company you feel is in the best overall shape in terms of ONLY the information provided to you.

You will use the instant messenger text chat to work together with your partners. You can talk to your group members by double clicking their name in the instant messenger program. A chat box will pop up and you can type messages to this group member in the box on the bottom of this screen. Click 'Enter' to send the message to your team member.

The instant messenger program is setup so that you must talk to each team member individually; please do NOT create a chat room for your group. Also, please DO NOT close the instant messenger windows, I will be saving these at the end of the study.

While all three of you are expected to work together on this task, you must agree on the final decision. I will give team member Arlington the group's decision sheet and Arlington will record your group's decision by ranking the companies 1 through 3 on the sheet provided. You will have 20 minutes to complete this task.

Appendix H. Intellectual Task

ALPHA COMPANY

SHARED

S1: Alpha is a diversified health care, animal health, consumer products and chemical company. Drug sales accounted for half of the company's earnings.

S2: Alpha expects to have a 20% increase in its earnings over the next 5 years.

S3: Currently, drugs have the highest profit margins of any product category.

S4: The United States and Canada account for 95% of the company's sales. The company currently has plans for European expansion. Drug regulations are less strict in Europe than they are in the U. S.

S5: Alpha is also planning on selling its less profitable chemical companies to invest more money in the research and development of pharmaceuticals.

S6: It has a "very good" debt rating, signifying that it has low debt.

S7: Its aggressive research and development spending in the 1980's is paying off. It developed 9 promising drugs during that time. One of these drugs is an antidepressant that will be used for treating bulimia and obesity. Sales are expected to reach \$1 billion in 1995.

UNSHARED

U1: The average length of employment at Alpha is 8.1 years.

U2: Ratio of managers to workers is 1:15, which is lower than the national average.

U3: Current CEO has been in position for 3 years.

U4: Legislature is pending that may increase governmental control over insurance reimbursements of drugs to drug companies, which would greatly reduce their profit margins.

U5: The company has received some bad press on one of its drugs for fears that it may make one prone to acts of violence or suicide. However, these allegations have not yet been proven.

U6: Three claims have been brought (as of July 1991) against Alpha for its dysfunctional heart valves. The compensation paid to each has ranged from \$500,000 to \$1,000,000.

BETA INCORPORATED

SHARED

S1: Beta is the leading U.S. household products marketer with dominant market shares in detergents, soaps, disposable diapers and shampoo. The company also has a sizable food business, which has significant market positions in coffee, vegetable oils, peanut butter and orange juice.

S2: Beta expects to have a 12% increase in its earnings over the next five years.

S3: Household products have relatively small profit margins, but have a high and stable volume of sales.

S4: Management's goal is to expand European markets and joint ventures in Korea and China. The company expects foreign markets to account for 20% of its income by 1995.

S5: Beta plans to expand both its U.S. and foreign food business.

S6: It has a "good" debt rating, signifying that it has relatively low debt.

S7: It plans to increase its research and development spending on new low calorie food products, which is a quickly growing market

UNSHARED

U1: The average length of employment at Beta is 7.3 years.

U2: Ratio of managers to workers is 1:8, which is equal to the national average.

U3: Current CEO has been in position for 2 years.

U4: A comprehensive research study has shown that most consumers have very positive attitudes toward the company and trust the company's products. They report being very willing to try any new product launched by the company.

U5: The company spends more money on advertising than any other company in the United States. Each of the company's products gets better advertising exposure than its competitors.

U6: It has also developed a cholesterol-free, fat substitute, which could also be a major product breakthrough, given the current health conscious trend in the U.S. This fat-free substitute can be used in the place of any fat in products from TV dinners to desserts to snack foods. It is very likely that it will be approved by the U.S. Food & Drug Administration.

GAMMA

SHARED

S1: Gamma is the leading and most profitable cigarette manufacturer worldwide. It has the largest selling brand in the world.

S2: Gamma expects to have an 18% increase in its earnings over the next 5 years.

S3: Cigarettes have one of the highest profit margins of any product category (aside from pharmaceuticals). Cigarette sales accounted for 60% of the company's profits.

S4: The company already has an excellent foreign presence. It owns several international food companies including the largest European and third largest world coffee and chocolate manufacturer.

S5: Worldwide consumption of cigarettes grew 2% in 1990 and is expected to continue, particularly in Asian and Eastern European countries. The company plans to continue investing in its Eastern European and Asian markets. Its exports of cigarettes and food products to Japan and Russia increased 20% in 1990 and are expected to increase 25% each year for the next five years. The company also wants to develop markets in Hungary, Czechoslovakia, Thailand, China, and Malaysia.

S6: Gamma has an "excellent" debt rating, signifying that it has no debt.

S7: Money for research and development in the last several years has been spent on the research and development of new markets, not new products. This trend is expected to continue.

UNSHARED

U1: The average length of employment at Gamma is 5.3 years.

U2: Ratio of managers to workers is 1:15, which is much lower than the national average.

U3: Current CEO has been in position for 6 years.

U4: Domestic consumption of cigarettes fell 2% in 1990 and the trend is expected to continue.

U5: Federal taxes on cigarettes and liquor are expected to increase 10% in the next 5 years.

U6: A current suit of the cigarette companies by the relatives of a woman who smoked for 30 years and eventually died of lung cancer is pending. No decision has been reached yet.

Appendix I. Judgment Task Instructions

Please read the instructions with me as I read them out loud. This task involves a cultural misunderstanding. You will first be given 10 minutes to read over the article and write down your decision as to 1) who was at fault and 2) how would you have resolved this conflict. Please record these responses under *Initial Decision*.

After each team member writes down his or her initial opinion, you will have 20 minutes to discuss this article as a group and come to a consensus as to 1) who was at fault and 2) how you would have resolved this conflict. Please try to reach a group decision on both of these questions. However, if you absolutely cannot reach an agreement, then you can write down your own opinion. Please record the group's decision under *Group Decision*. Each group member will record his or her initial decision as well as the group decision.

Appendix J. Judgment Task

The moment that destroyed Mansour Fooian's faith in America was not when the police came for his children. He tried to tell the officers he had not laid a hand on his daughters, he recalled, but he was a stranger in a strange land, a refugee who knew neither the law nor the language, and they took his girls away in a patrol car. Still, he believed the episode was simply a misunderstanding that would be resolved in due time.

However, when the daughters were placed in a foster home with an American family, the family began to fear their daughters would lose their cultural and moral heritage. Other immigrants in the area backed the family's appeal to regain custody of their children and the community was divided along cultural lines.

The incident began when the girls complained to a former teacher that their father struck them, cursed them and spit on them, and the allegations were reinforced by neighbors who reported that an argument inside the Fooian's home spilled out into the street and one of the girls ran from the home, screaming and with her shirt torn.

For child welfare authorities, the case is a political and legal tightrope that illustrates the tension inherent in America's experiment with balancing individual freedoms against standards of right and wrong in an increasingly diverse nation. While officials here say they want to respect the family's culture and religion, their bottom line is to ensure the children are safe.

“The community’s outrage can really become a convenient way for the family to avoid addressing some very real issues,” said Michael Lynch, executive director of Teen Ranch, a private foster care agency in suburban Detroit that contracts with the state to care for abused children. “The father needs learn to speak English, and he’s going to have to learn what is acceptable in terms of discipline and what is not.”

The family left their war torn native land to search for a better life. With help from the United Nations, the family moved to Nebraska in June 1994. A year later, they moved to Detroit, a city with more immigrants from their native land.

The family’s adjustment was difficult, but not atypical. Accustomed to the rigid discipline of their native land and religion, the adolescent girls began to gravitate toward newfound school friends and the more carefree ways of American teenagers. They wanted to date boys, wear jeans and discard their traditional clothing.

Their father would not have it. Wary that the values of his adopted homeland would lead his daughters to drugs, teenage pregnancy or even prostitution, he cracked down on them even harder in Detroit. He forbade them to leave home without a chaperone, to talk on the telephone to boys and required them to wear their traditional clothing whenever they left the house.

The girls rebelled. At one point last summer, one of the girls called a teacher in Nebraska with whom she had remained in contact and complained of abuse at the hands of her father. The teacher alerted Detroit police, who paid a visit to the Fooian’s home in August.

Using the family's oldest son to interpret, they said a complaint had been made and asked each of the children if they had been harmed. None of the children – all of whom speak English – reported any abuse. Seeing no signs of trouble, they left.

But an argument erupted when the father – angry and insulted by the visit – demanded that the girls tell him who said what to the teacher in Nebraska. Finger-pointing ensued and one of the girls tried to leave the house. Neighbors reported hearing screams and subsequently saw the teenage girl in the street, her clothes in tatters. Police returned and removed all of the children from the home.

“We were very fearful,” Fooian said. “We stayed up all night crying. We didn’t understand why they had done this to us. I never harmed my children. I just wanted to protect them from the atrocities I see on the streets and on TV: drugs, murder, rape, pregnancy.”

Other immigrants in the community suspected the girls’ claims of abuse were exaggerated, a juvenile effort to get back at their controlling parents, and many rallied around the family.

“Even if the family wasn’t perfect in dealing with the girls, we thought that they should have been provided with an opportunity to correct it. We’re not talking about parents who had a problem with drugs or alcohol. These are parents who loved their children and tried to raise them with ethics and morality and tried to save their children from moral corruption.”

When child welfare officials learned of the community’s concerns, they agreed to “fast track” the licensing process to move the girls into a foster family from their native

land. A Wayne County judge is scheduled to decide whether to return the children to their parents next week.

Initial Decision: Please answer the following questions before discussing the article with your team members.

1. Who was at fault in this situation?

2. How would you have resolved this situation?

Group Decision: After discussing the article with your group, please record the group's final decision.

3. Who was at fault in this situation?

4. How would you have resolved this situation?

Appendix K. Description of Measures not Included in Final Analyses

Group and Subgroup Identification. A nine-item scale developed by Hinkle, Taylor, & Fox-Cardamone (1989) was used to assess identification with the entire group. The scale measures emotional, individual/group opposition (how much one diverges from other group members), and cognitive aspects of group identification at the group level. Questions were recorded on a five-point scale ranging from “Strongly Disagree” to “Strongly Agree.”

In order to tease apart identification with the group as a whole versus identification with individual subgroup measures, a subset of items from Hinkle et al.’s (1989) group identification measure were used to assess individual level identification. Several questions were modified to the individual level and others that were unable to be modified were dropped, resulting in a five-item individual identification scale.

3.3.4 Performance. Performance on the intellectual task was assessed by assigning points for correct answers. If the team chose Beta as the best company they were awarded two points, if the team chose Beta as the second best company they were awarded one point and if the team chose Beta as the worst company they were awarded no points.

Performance on the judgment task was measured by consensus and choice shift. If any group members disagreed on either question, a disagreement was recorded and the total number of disagreements in the group were summed across the two questions. If all group members retained their initial positions, then no choice shift occurred. If one or

more participants switched his or her initial opinion, then this was coded as a choice shift in the group and the total number of choice shifts in the group was also summed across the two questions.

3.3.5 Communication Frequency. Communication frequency was measured by examining chat transcripts and counting the number of times that each person sent a message. Each message, regardless of length, that person sent was counted as one communication with that group member. Communication frequency was coded between dyads as well as at the group level.

Communication Hostility. Communication hostility was measured by a single rater coding the chat transcripts. Communication hostility was coded in accordance with Wilson et al. (2006) and included teasing ('Did you wake up on the wrong side of the bed today?'), antagonistic ('Don't take all day over there!'), and offensive words ('I'm going to kick your ass!').

Language Proficiency/Culture. Language proficiency was measured with a two-item self-report measure asking participants to rate their English proficiency on a 1-5 scale ranging from "I have difficulty reading and writing in English" to "I read and write in English very well" and the second question "I have difficulty speaking in English" to "I speak English very well." These two items were averaged to create a language proficiency scale.

Culture was measured with a 12-item scale adapted from the Individualism-Collectivism Interpersonal Assessment Inventory (ICIAI) (Matsumoto et al., 1997). The original scale contains 25-items, taps both importance and behavioral dimensions, and

asks each question in reference to four different social groups (i.e., family, close friends, colleagues, and strangers). In order to cut down the length, the measure was reduced roughly in half, only included importance items, and only the family and stranger reference groups. The items were averaged and the scale was not found to reduce into separate factors (Matsumoto et al., 1997), therefore items were eliminated based on their relevance to the sample. In addition, the behavioral dimension is more likely to be influenced by individual difference factors and so only the importance dimension were assessed. Finally, the questions were addressed in regards to family and strangers to assess collectivism towards familiar and unfamiliar others as some cultures differ in their collectivistic tendencies in formal and informal situations.

The ICIAI was found to demonstrate adequate internal and external validity as well as test-retest reliability over several trials (Matsumoto et al., 1997). Each question was asked from either the stem “Regarding family members, how important is it for you...” or “Regarding strangers, how important is it for you...” Responses were coded on a 1-5 scale ranging from “Not at all Important” to “Very Important.” Responses were averaged across all 12-items to determine one’s proclivity towards individualism or collectivism with separate scales for family and strangers.

Business experience. Participants were asked to indicate the number of years they have worked in a professional business environment and the number of business classes taken. These two questions were averaged to create a business experience scale.

Expectations of Similarity. Two questions addressing expectations of similarity for ingroup and outgroup members were adapted from Phillips (2003). The questions are,

“To what extent do you expect ___ to agree with your decision on the task?” and “What is the likelihood that ___ will come to the same decision as you on the task?” These questions were measured on a five-point scale ranging from “Not Very Likely” to “Very Likely.”

Group Cohesion. Group cohesion was measured with a modified version of the Gross Cohesion Questionnaire (Gross, 1957, in Stokes, 1983), one of the most widely used measures of cohesion in the literature (Bednar & Battersby, 1976; Crews & Milnick, 1976; Kirshner et al., 1978). Five of the seven original items were deemed appropriate for a small group laboratory study. Questions were reworded to fit a five-point scale ranging from “Strongly Disagree” to “Strongly Agree.”

Satisfaction. Green and Taber’s (1980) five-item satisfaction measure was used to assess group satisfaction. These items tap satisfaction with the outcome, the process, and personal responsibility for the decision. The coefficient alpha for this measure was found to be .88 (Green & Taber, 1980). All items were assessed on a five-point scale ranging from “Not at All” to “A Very Great Extent.”

Process Effectiveness. A 16-item measure of process effectiveness was adapted from Reagan and Rohrbaugh (1990). Three of the original scales (legitimacy of decision, data-based process, and accountability of decision) were dropped because they were not applicable to the current study. Five scales were retained including goal processes (three-items), efficiency of the decision (three-items), adaptable processes (four-items), participatory processes (three-items), and supportability of decision (three-items). A five-

point scale ranging from “Strongly Disagree” to “Strongly Agree” was used. Internal reliabilities of these scales range from .66 to .71 (Reagan & Rohrbaugh, 1990).

Personal Sense of Power. An eight-item measure of personal sense of power was adapted from Anderson et al. (2006). Items were adapted from the group level to the individual level. A five-point scale ranging from “Strongly Disagree” to “Strongly Agree” was used.

Psychological Safety. Edmondson’s (1999) seven-item measure of team psychological safety was measured. Responses were coded on a five-point scale ranging from “Strongly Disagree” to “Strongly Agree.”

Appendix L. Measures

Demographics

1. What is your gender?
2. What is your age?
3. What is your current GPA (or high school GPA if you have not completed one semester of college)?
4. What was your total SAT score?
5. What was your TOEFL score (if applicable)?
6. What is your year in school?
7. What is your undergraduate major?
8. Please indicate your race/ethnicity.
9. In which country were you born?
10. What was the first language that you learned to speak?
11. On a scale of 1-5 (with 1 being Not at All and 5 being Very Well) please indicate how well you know your team members.
12. On a scale of 1-5 (with 1 being None and 5 being Very Experienced) please indicate your level of experience with computers.
13. On a scale of 1-5 (with 1 being None and 5 being Very Experienced) please indicate your level of experience with instant messenger.

Language Proficiency

1. How would you rate your skill in speaking English?
2. How would you rate your skill in reading and writing English?

Culture (Matsumoto, Weissman, Preston, Brown, & Kupperbusch, 1997)

1. To comply with direct requests.
2. To maintain self-control.
3. To share credit for accomplishments.
4. To share blame for failures.
5. To respect and honor traditions and customs.
6. To respect elders.
7. To maintain harmonious relationships with others.
8. To accept your position or role in life.
9. To exhibit “correct” behaviors (i.e., proper manners and etiquette), regardless of how you really feel.
10. To accept awards or recognition based only on age or position rather than merit.
11. To follow the norm.
12. To identify with a group.

Business Proficiency

1. How many years of experience do you have working in the business world (not including retail or service industries)?
2. How many business classes have you taken as an undergraduate or graduate student?
3. Please rate your proficiency with PowerPoint.
4. Please rate your proficiency with Excel.

Group Identification (Hinkle, Taylor, & Fox-Cardamone, 1989)

1. I identify with this group.
2. I am glad to belong to this group.
3. I feel held back by this group. (reversed)
4. I think this group worked well together.
5. I see myself as an important part of this group.
6. I do NOT fit in well with the other members of this group. (reversed)
7. I do NOT consider the group to be important. (reversed)
8. I feel uneasy with members of this group. (reversed)
9. I feel strong ties to this group.

Individual Identification (adapted from Hinkle et al., 1989)

1. I feel that ___ held us back. (reversed)
2. I think I worked well with ___.
3. I do not have much in common with ___. (reversed)
4. I feel uneasy with ___. (reversed)
5. I feel a strong tie to ___.

Expectations of Similarity (Phillips, 2003)

1. To what extent do you expect ___ to agree with your decision on the task?
2. What is the likelihood that ___ will come to the same decision as you on the task?

Trust (Individual Level) (McAllister, 1995, adapted by Wilson et al. (2006)) (On a 5-point scale ranging from “Strongly Disagree” to “Strongly Agree”)

1. I can freely share my ideas and feelings with ____.
2. If I shared my concerns with ____, I know that they would respond constructively and caringly.
3. I can rely on ___ not to make my decisions more difficult by careless work.
4. Given my experience with ____, I see no reason to doubt his/her competence for the task.
5. I have sometimes found it necessary to disregard ___’s recommendations to make a good decision.

Expectations of Team Members

1. Which team member do you expect you will get along with the most?
2. Which team member do you expect you will get along with the least?

Group Cohesion (Gross, 1957)

1. The other group members fit what I feel to be the ideal of a good group member.
2. I did NOT feel that I was included in the task by other group members. (reversed)
3. I enjoyed the task that I completed as a member of this group.
4. If I were asked to complete another task like this one, I would like to be with the same people.
5. I did NOT like this group. (reversed)

Relationship Conflict (Individual Level) (Jehn, 1995)

1. How much friction was there between you and ____?
2. How much personality conflict was there between you and ____?
3. How much tension was there between you and ____?
4. How much emotional conflict was there between you and ____?

Task Conflict (Individual Level) (Jehn, 1995)

1. How often did you disagree with ____ about opinions regarding completion of the task?
2. How frequently did you experience conflict about ideas with ____?
3. How much conflict about the task was there between you and ____?
4. To what extent were there differences of opinion between you and ____?

Satisfaction (Green & Taber, 1980)

1. How satisfied are you with the quality of your group's solution?
2. To what extent does the final solution reflect your inputs?
3. To what extent do you feel committed to the group solution?
4. To what extent are you confident that the group solution is correct?
5. To what extent do you feel personally responsible for the correctness of the group solution?

Process Effectiveness (Reagan & Rohrbaugh, 1990)

Goal Processes

1. All of the decision alternatives were carefully weighed.
2. Some of the key issues necessary to complete the task were not fully considered. (reversed)
3. The group's process did not capitalize on the wisdom and experience of the group. (reversed)

Efficiency of Decision

1. Time was wasted in the process of making a decision. (reversed)
2. The task was completed in less time than we were given.
3. The group worked together productively with hard but worthwhile work.

Adaptable Perspective

1. The group was very flexible in dealing with the problem.
2. Certain preconceived ideas blocked more creative thinking on the task. (reversed)

3. The group came up with innovative ways of solving the task.
4. The group was too structured. (reversed)

Participatory Process

1. Group members were encouraged to raise questions and express personal concerns even if they went against the majority opinions.
2. We went to great lengths to understand the interests and concerns of every member of the group.
3. Conflict was dealt with constructively.

Supportability of Decision

1. Our group came to a common understanding of the problem.
2. It was impossible for our group to come to a full consensus. (reversed)
3. At the end of the task the group displayed high morale and strong “team spirit”.

Personal Sense of Power (Anderson, John, & Keltner, 2006) (On a 5-point scale ranging from “Strongly Disagree” to “Strongly Agree”)

1. My wishes didn't carry much weight.
2. Even if I voiced them, my views had little sway.
3. My ideas and opinions were often ignored.
4. I could get team members to listen to what I said.
5. I was able to get others to do what I wanted.
6. Even when I tried, I was not able to get my way.
7. I felt I had a great deal of power in this team.
8. If I wanted to, I could get to make the decisions.

Team Psychological Safety (Edmondson, 1999) (On a 5-point scale ranging from “Strongly Disagree” to “Strongly Agree”)

1. If you make a mistake on this team, it is often held against you.
2. Members of this team are able to bring up problems and tough issues.
3. People on this team sometimes reject others for being different.
4. It is safe to take a risk on this team.
5. It is difficult to ask other members of this team for help.
6. No one on this team would deliberately act in a way that undermines my efforts.
7. Working with members of this team, my unique skills and talents are valued and utilized.

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CURRICULUM VITAE

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