

Chapter 3

GROUP HETEROGENEITY AND FAULTLINES: COMPARING ALIGNMENT AND DISPERSION THEORIES OF GROUP COMPOSITION

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ABSTRACT

This field study examines group diversity from two theoretical viewpoints: dispersion approach (heterogeneity) and alignment approach (faultlines). We argue that the alignment approach provides an additional explanatory tool to that of the dispersion approach in understanding the effects of group composition on process and outcomes. Data from 60 work groups show that whereas groups with strong faultlines had higher levels of intragroup conflict and lower levels of performance and satisfaction, groups that were heterogeneous in tenure and functional background had higher levels of performance. Task conflict and process conflict mediated the relationship between faultlines and satisfaction. Our findings suggest that whereas both views of diversity contribute to our understanding of the relationship among

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group-level diversity, group processes, and performance, the rationale underlying group faultlines (the alignment approach) provides, in general, a more comprehensive explanation of group processes and performance than does a group heterogeneity model alone.

INTRODUCTION

As the trend continues toward greater economic globalization and societal diversity, companies are recognizing the need to leverage the various backgrounds of their employees to sustain their competitive advantage in a global marketplace (Jehn and Bezrukova, 2004; Thomas and Ely, 1996). This trend is paralleled by the realization, reinforced with empirical evidence, that well-managed work groups can serve as catalysts to multiply the contributions of individual employees (Bishop, Scott, and Burroughs, 2000; Donnellon, 1996). Unfortunately, it appears that these two trends frequently fail to intersect and produce synergistic benefits for companies (Kochan, Bezrukova, Ely, Jackson, Joshi, Jehn, Leonard, Levine, and Thomas, 2003). This may be attributed to potential challenges that managers face regarding how to properly translate the diversity of work groups into higher profits.

In response, many researchers have tackled the issues related to diversity in teams. However, the results of the studies have been rather contradictory and thus inconclusive; diversity seems as likely to hinder performance as it is to improve it (compare Riordan, 2000; Williams and O'Reilly, 1998). According to the recent reviews of diversity and relational demography research, one reason for these contradictory findings is the lack of theoretical guidance for understanding diversity in teams (Jackson, Joshi, and Erhardt, 2003; Webber and Donahue, 2001).

The most recent response to this claim of theoretical inadequacy has been to focus on the issue of demographic alignment as put forth in the group faultline theory introduced by Lau and Murnighan (1998). Previous diversity research has mainly drawn on heterogeneity, or the dispersion view of group composition. Group diversity has been explained either through changes in information processing (for example, introducing a broader array of information) or through a social categorization process (for example, favoring in-groups and derogating out-groups to enhance self-construals) (Williams and O'Reilly, 1998). From a methodological standpoint, this line of research emphasizes the degree of distribution among group members along relevant dimensions of attributes (Alexander, Nuchols, Bloom, and Lee, 1995). This work has been criticized because it is based on the assumption that these demographic attributes are independent. For instance, when examining race, gender has been ignored, leading to the assumption that the experiences of African American

men in a group would be similar to that of African American women in an otherwise identical group (for example, Roth, Huffcutt, and Bobko, 2003).

The alignment approach, in turn, argues that the compositional dynamics of interacting multiple attributes affects group processes more than separate demographic characteristics (for example, Lau and Murnighan, 1998). Members who share several similar attributes are likely to align and coalesce into subgroups, reinforcing one another and differentiating themselves from other subgroups in a team (Earley and Mosakowski, 2000; Cramton and Hinds, 2005). Although some theorizing about interacting or overlapping demographic dissimilarities has been done in the past (for example, see the literature on multiform heterogeneity: Blau, 1977, and Kanter, 1977; also see more recent studies: Lau and Murnighan, 2005; Li and Hambrick, 2005; Roccas and Brewer, 2002), research examining the alignment properties of such overlaps and the resulting splits within a group has remained scarce.

Moreover, previous studies have shown significant effects for various demographic heterogeneity factors (for example, age, race, gender, tenure) on group processes and performance. Although these findings are important, a weakness of this previous research is that none of the studies has contrasted group faultline models (that is, alignment) with group heterogeneity models (that is, dispersion). Therefore, the main purpose of our study is to examine the relative importance of group faultlines and group heterogeneity on group processes and performance. We hope to explain the missing variance inherent in the studies that examined only group heterogeneity. For several reasons, we believe that the rationale underlying group faultlines provides a better explanation of group processes and performance than does the rationale underlying group heterogeneity alone. Our central argument is that the presence (or absence) of certain demographic differences within a group may (or may not) influence members' behaviors, but the particular alignment of group members based on these differences will influence behavior. Alignment explains how evolving subgroups may become polarized around certain viewpoints because of conformity pressure arising within subgroups and competition across them (Lau and Murnighan, 1998; Thatcher, Jehn, and Zanutto, 2003; Wit and Kerr, 2002); therefore, "faultlines may have more potential for performance losses owing to increased conflict" (Lau and Murnighan, 1998, p. 327). Thus, our second theoretical contribution is to extend conflict literature by examining how group composition based on alignment enables us to better explain how group composition acts as an antecedent of conflict. Our methodological contribution to existing research on group composition and faultlines comes in the form of examining the predictive power of both heterogeneity variables and faultline variables on group processes and outcomes. Understanding how forms of group composition affect group processes and outcomes will provide valuable information to managers as they form and supervise teams.

DISPERSION VERSUS ALIGNMENT

We classify approaches to group composition into two types, the dispersion approach and the alignment approach. Group composition research based on the dispersion approach¹ examines how members' attributes are distributed within a group and how this dispersion may influence a number of group outcomes (McGrath, 1998; Milliken and Martins, 1996; Moreland and Levine, 1992). The concept of heterogeneity has been often used to reflect dispersion in this line of research. Social-categorization theory, the similarity/attraction paradigm, and the cognitive-resource perspective have been used to explain the theoretical mechanisms underlying the relationship among heterogeneity, group process, and performance. Social-categorization theory posits that individuals classify themselves and others into in-group and out-group categories. Classification occurs to enhance positive self-construal and to make predictions about subsequent interactions (Tajfel and Turner, 1986). These categorization processes tend to give rise to stereotypes, prejudice, and out-group discrimination that may result in conflict and lead to substandard performance (Jehn, Northcraft, and Neale, 1999; Pelled, Eisenhardt, and Xin, 1999). Byrne (1971) proposed the similarity/attraction paradigm to explain why people are attracted to similar others and why they apply negative assumptions to those who are dissimilar (Byrne, 1971). The similarity/attraction paradigm suggests that demographic characteristics serve as a method for determining similarity, leading to more frequent communication and a desire to remain in the group (Lincoln and Miller, 1979). Finally, a cognitive-resource perspective suggests that the dispersion of member attributes supplies a large amount of information and facilitates a complex problem-solving process. That is, decision making of high quality may arise from different experiences and perspectives that diverse group members bring to their team (Dahlin, Weingart, and Hinds, 2005; Gruenfeld, Mannix, Williams, and Neale, 1996).

Although much empirical work has been conducted under the dispersion framework, there is still no consensus around the relationship between diversity and performance (Williams and O'Reilly, 1998). Some studies have shown that diversity leads to decreased levels of performance (Michel and Hambrick, 1992; Thatcher, 1999; Zajac, Golden, and Shortell, 1991) due to social-categorization and similarity/attraction effects (Byrne, 1971; Tajfel and Turner, 1986). Other studies have shown that diversity can improve group performance (Bantel and Jackson, 1989; Hambrick, Cho, and Chen, 1996; Eisenhardt, Kahwajy, and Bourgeois, 1997) by increasing cognitive-resource diversity (Ancona and Caldwell, 1992; Gruenfeld et al., 1996). Still other studies have shown no relationship between diversity and performance (O'Reilly, Snyder, and Boothe, 1993; Wiersema and Bantel, 1992).

An alignment approach to group composition suggests that whereas the social-categorization processes may be similar for heterogeneous and faultline-based groups,

there will be additional perceptual categorizations and behavioral outcomes due to the creation of subgroups based on overlapping similarities in faultline-based groups. An overlap of social categories sharpens the boundaries around subgroups and results in salient subgroup identities. The added effect of this overlap is that strong subgroups emerging from faultlines may be less fluid and more stable, especially as more characteristics align. Thus, alignment models predict group processes and performance as a function of simultaneous alignment across members based on multiple characteristics. This differs from the dispersion models of group composition, which do not take into account the interdependence among multiple forms of diversity. The heterogeneity concept, for example, captures the degree to which a group differs on only one demographic characteristic (for example, gender; see Table 3.1 for comparison between faultlines and diversity scores) while often ignoring other demographic characteristics (for example, race) (McGrath, 1998). Even when dispersion researchers take into account more than one demographic characteristic by examining overall demographic diversity (for example, Schippers, Den Hartog, Koopman, and Wienk, 2003), they use an additive model and aggregate the effects of the single-characteristic dispersion model (for an exception, see Alexander et al., 1995). Although these aggregate dispersion models explain the degree to which a group is demographically different on age *and* gender *and* tenure, for instance, they inadequately reflect the degree of interdependence among these characteristics. For example, we are unable to tell if all the Caucasians in a group are also men. This limitation is overcome in alignment-based research.

Three areas of work inform the theoretical mechanisms underlying the alignment perspective: multiform heterogeneity (Blau, 1977; Kanter, 1977), group faultlines (Lau and Murnighan, 1998), and factional groups (Hambrick, Li, Xin, and Tsui, 2001; Li and Hambrick, 2005). The literature on multiform heterogeneity has stressed the importance of focusing on the multiple parameters of social structure (for example, sex, race). Multiform heterogeneity refers to overlapping groups and subgroups generated by the differences in sex, race, national background, religion, and so on (Blau, 1977). Consolidated or highly correlated parameters strengthen in-group bonds and reinforce group barriers, whereas low correlation among them indicates the intersection of parameters that promotes group integration.

Faultline theory reasons that the compositional dynamics of multiple attributes (for example, alignment) have a greater effect on group processes and performance than separate demographic characteristics (e.g., Lau and Murnighan, 1998; 2005; Thatcher et al., 2003). Faultline theory defines group faultlines as hypothetical dividing lines that split a group into relatively homogeneous subgroups based on the group members' demographic alignment along one or more attributes (adapted from Lau and Murnighan, 1998). For instance, Cramton and Hinds (2005) have theorized about how the alignment of compositional diversity and geographic distribution creates tension between subgroups emerging from faultlines. In a study of the formation

Table 3.1
Examples of Groups with Strong and Weak Faultlines and Diversity Scores

Group Number	Member				L&M			T,J,&Z		
	A	B	C	D	Member	Faultline Strength*†	Race Diversity	Sex Diversity	Age Diversity	Fau Strength Score‡
1	White male 21	White male 21	Black female 50	Black female 50	Black female	Very strong (3 align, 1 way)	.5 (medium diversity score)	.5 (medium diversity score)	.472 (medium diversity score)	1.00
2	Asian female 21	White male 21	Black female 25	Asian male 35	Asian male	Weak (1 align, 3 ways)	.625 (high diversi- ty score)	.5 (medium diversity score)	.259 (low diversity score)	.51
3	White male 21	White male 21	Black female 30	Black female 30	Black female	Very strong (3 align, 1 way)	.5 (medium diversity score)	.5 (medium diversity score)	.204 (very low diversity score)	1.00

*With the number of identified attributes fixed at three, faultline strength, as defined by Lau and Murnighan (L&M) (1998), is determined here by the number of demographic attributes that align (denoted as "align") and the possible ways to subdivide the group on the basis of these attributes (denoted as "ways").

†We use the following classification of faultline strength, based on the maximum number of characteristics that align: 1 = weak, 2 = medium, 3 = strong, 4 = very strong.

‡This is the faultline score as measured by the Fau algorithm in Thatcher, Jehn, and Zanutto (T,J,&Z) (2003). Race and gender are categorical variables. Age is continuous. The data are rescaled so that all of these are equivalent: twenty-year difference in age, difference in gender, difference in race.

of breakaway organizations, Dyck and Starke (1999) found that competition between the breakaway group and supporters of the status quo became evident when there was increased alignment of subgroup members.

Finally, Hambrick and his colleagues argue that in international joint ventures (IJVs), “compositional gaps” that occur along multiple demographic dimensions (for example, culture, age) in factional groups may accentuate managerial coalitions and influence group functioning and effectiveness (Hambrick et al., 2001; Li and Hambrick, 2005). A compositional gap is the difference between managerial coalitions on one or more dimensions that are of potential importance to the group’s functioning. This gap separates a group into two distinctly different factions, where a faction is relatively homogeneous or is tightly clustered around its own central tendency (Hambrick et al., 2001; Li and Hambrick, 2005). Studies of IJV management groups have shown that the formation of subgroups based on demographics is inherently coalitional and is likely to reduce identification with the whole team and negatively affect group functioning and IJV effectiveness (Earley and Mosakowski, 2000; Hambrick et al., 2001).

In sum, the alignment approach to group composition takes into account the facts that (1) individuals have multiple identities simultaneously (for example, Asian, male) rather than one identity at a time (Asian), (2) these identities are interdependent, and (3) they interact with one another. Thus, the alignment approach accounts for the interdependence among multiple demographic characteristics that the dispersion approach often neglects.

COMPOSITIONAL EFFECTS ON CONFLICT AND PERFORMANCE

Theorizing on group diversity suggests that group composition influences patterns of interaction in a group (for example, conflict) and affects outcomes (for example, performance, satisfaction) (Williams and O’Reilly, 1998). In this study, we focus on three types of conflict—relationship conflict, task conflict, and process conflict—that have been identified in working groups, bicultural teams, and other organizing entities (Amason, 1996; Jehn, 1997; Jehn et al., 1999; Pelled, 1996). Since most dispersion studies in the literature on group diversity are concerned with the effects of diversity on conflict and group performance, we develop our rationale predicting first, the effects of heterogeneity and second, the effects of faultlines on group-level conflict and performance. In general, we believe that faultlines will be better predictors of performance due to the effects of additional social categorization (the particular subgroup within the larger group).

The dispersion approach is based on theories of social identity and social categorization (Tajfel and Turner, 1986), which assert that individuals classify themselves and others into social categories based on demographic characteristics (for example,

race, gender, function). Group members confirm their affiliation with a certain category by showing in-group favoritism and out-group hostility (Tajfel and Turner, 1986). As a result of these negative categorization processes, individuals in groups with high levels of heterogeneity may experience frustration, discomfort, hostility, and anxiety resulting in high levels of relationship conflict (disagreements and incompatibilities about personal issues unrelated to the task) and low levels of satisfaction (Jehn, 1997). For example, heterogeneity on the dimensions of gender and ethnicity is related to interpersonal tension, low levels of friendliness, and low levels of satisfaction (Jehn et al., 1999; O'Reilly, Caldwell, and Barnett, 1989; Pelled, Xin, and Weiss, 2001).

Likewise, the alignment approach also predicts conflict based on similarity/attraction and social categorization, but there are additional perceptual and behavioral phenomena due to the creation of subgroups based on overlapping similarities. Members' perception of distinct subgroups and their engagement in coalition formation as a result of an alignment are examples of such phenomena. Alignment perspective suggests that these strong subgroupings resulting from faultlines can lead to political issues and covert relationship conflict in the group (Lau and Murnighan, 1998). Members of one subgroup may develop negative stereotypes toward members of another subgroup while simultaneously cultivating homegrown stereotypes (overly positive generalizations that groups develop about their own characteristics) to support their own subgroup (Prentice and Miller, 2002). This us-versus-them mentality in subgroups may incite antagonism from members of one subgroup toward members of another subgroup (Labianca, Brass, and Gray, 1998). We argue that as a result, members of such groups will perceive that the overall work group is filled with tension and anger, resulting in high levels of intragroup relationship conflict and low levels of satisfaction.

Groups with high levels of heterogeneity and groups with strong faultlines are both predicted to experience high levels of relationship conflict and low levels of satisfaction; we now explain why we expect faultlines to have a stronger effect than heterogeneity. Literature based on the cross-categorization perspective (for example, Brewer, 2000; Hewstone, Rubin, and Willis, 2002; Vanbeselaere, 2000) suggests that members of groups with faultlines may exhibit stronger intergroup bias and animosity toward members of another subgroup than do individuals in heterogeneous groups due to an additional social categorization (the particular subgroup within the larger group). Members of heterogeneous groups may possess crosscutting social identities that contribute to cooperative contact by reducing bias toward out-group members (Brewer, 2000; Ensari and Miller, 2001). For example, two women in a group may consider the male members to be an out-group; however, if the female members and some of the male members are white, the category of race will crosscut that of gender. This crosscutting will dilute the out-group bias based on gender. Therefore, we propose that intergroup bias based on the alignment of multiple char-

acteristics (faultlines) may result in more negative stereotyping and animosity than that occurring in heterogeneous groups. Thus, we posit the following hypothesis:

***Hypothesis 1 (H1):* Whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup relationship conflict and low levels of satisfaction, faultlines will have a stronger effect on relationship conflict and satisfaction than will heterogeneity.**

The dispersion approach suggests that members of heterogeneous groups are likely to have different training and socialization experiences (Lovelace, Shapiro, and Weingart, 2001; Mortensen and Hinds, 2001). Although these differences may reflect a variety of ideas and perspectives in a team (Milliken and Martins, 1996), they may also be the cause of debates and disagreements about group tasks (Tziner and Eden, 1985; Wittenbaum and Stasser, 1996). The presence of differing perspectives is likely to manifest itself as intragroup task conflict (Pelled et al., 1999). Task conflicts are disagreements among group members' ideas and opinions about the task being performed, such as disagreements regarding an organization's current strategic position (Jehn, 1997). Empirical studies have demonstrated that employees in groups that were heterogeneous in terms of the members' functional backgrounds and education experienced high levels of task-related conflicts (Jehn, Chadwick, and Thatcher, 1997; Pelled et al., 1999).

On the other hand, the alignment perspective would suggest that when groups have faultlines, members of emerging subgroups may freely express divergent opinions as they feel support from their subgroup members due to mutual liking and perceived similarity of aligned members (Lau and Murnighan, 1998; Phillips, 2003; Phillips, Mannix, Neale, and Gruenfeld, 2004). They may also have a tendency toward conformity to the opinion or perspectives favored by their own subgroup (Baron, Kerr, and Miller, 1993) and a need to distinguish their views from those of the other subgroup (Brewer, 2000; Hogg, Turner, and Davidson, 1990). The result—with each subgroup intensely polarized around its ideas and thoughts (Ancona, 1990) and exhibiting strong vocal support for its particular position—is a high level of intragroup task conflict.

We expect faultlines to be a better predictor of intragroup task conflict than heterogeneity. On the basis of research into interindividual/intergroup discontinuity (Schopler, Insko, Graetz, Drigotas, and Smith, 1991; Wildschut, Insko, and Gaertner, 2002), we argue that members of groups with faultlines may disagree over various ideas or perspectives in a more convincing way than do individuals in heterogeneous groups. Interindividual/intergroup discontinuity refers to the tendency for intergroup relations to be more competitive and less cooperative than interindividual relations (Schopler et al., 1991). One of the proposed explanations for this tendency

is that mutual social support for the competitive pursuit of self-interested behavior is available to subgroup members but absent for individuals (Wildschut et al., 2002). Although the potential exists that divergent viewpoints will emerge from heterogeneous groups, individuals in these groups may not actively share their points of view if they are not supported by others (Wit and Kerr, 2002). Groups with strong faultlines are likely to have intense conflicts over tasks because each subgroup rallies around one particular point of view (Lau and Murnighan, 2005). Thus, we propose the following hypothesis:

***Hypothesis 2 (H2):* Whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup task conflict, faultlines will have a stronger effect on task conflict than will heterogeneity.**

The dispersion perspective suggests that members of heterogeneous groups tend to rely on approaches to work that are particular to their backgrounds (Bantel and Jackson, 1989; Gruenfeld et al., 1996), and they display differing views about how one should approach a task (Jehn et al., 1999). These differences of opinion about how to do the work affects a group's ability to coordinate task progress (Behfar, Mannix, Peterson, and Trochin, 2005) and often results in disagreements over procedural issues (Jehn et al., 1999). Process conflict refers to disagreements about the process of doing a task or dealing with logistical problems—how task accomplishment should proceed in the work unit, who is responsible for what, and how things should be delegated (Jehn, 1997). For instance, research has demonstrated that heterogeneous groups experienced more difficulty defining how to proceed with their task than did homogeneous groups (Jehn, 1997; Watson, Kumar, and Michaelson, 1993).

The alignment approach proposes that members across subgroups formed by faultlines might have different "thought worlds" (Dougherty, 1987) and different understandings about how work should be done in a group. Members of such groups may feel that their priorities and work approaches are not aligned within a group, and so they may spend more time staking out territory and viciously arguing who does what, when, and how (Behfar et al., 2005). A faultline that breaks a group into subgroups may also inhibit boundary-spanning activities, leading to less coordination of interdependent but differentiated subgroups within a group (for example, Edmondson, 1999; Miles and Perreault, 1976). Under these circumstances, developing a shared approach to task accomplishment in groups with strong faultlines will be difficult, and process conflict will be more likely to surface.

Groups with high levels of heterogeneity and groups with strong faultlines are both predicted to experience high levels of process conflict; however, we expect faultlines to be a better predictor than heterogeneity. For example, a group with two

homogeneous subgroups whose respective members are aligned along two differing characteristics of age and tenure will be likely to have two very diverse approaches to a task. Assuming that each subgroup has several supporters, there is likely to be a strong degree of competitiveness between the two subgroups. Members of groups with strong faultlines may support certain ways of doing work favored by their respective subgroups, at the same time displaying prejudice and intolerance toward opinions of members of another subgroup. Heterogeneous groups, in turn, may have several divergent viewpoints, but without support from others, individuals may not vigorously compete and argue their points of view. Thus, whereas heterogeneous groups and groups with strong faultlines will both experience challenges in coordinating accomplishment of a task, groups with strong faultlines will disagree over process-related issues in a more competitive way than will heterogeneous groups. This leads us to the third hypothesis:

***Hypothesis 3 (H3):* Whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup process conflict, faultlines will have a stronger effect on process conflict than will heterogeneity.**

We further predict that heterogeneity and faultlines will have differing effects on a group's performance. The dispersion approach, which is grounded in the well-respected perspective of value in diversity, expects heterogeneous groups to outperform homogeneous groups because people who are different from one another are able to bring new knowledge, skills, and perspectives to the group (Cox, Lobel, and McLeod, 1991; Watson et al., 1993; Williams and O'Reilly, 1998). Whereas the value-in-diversity perspective acknowledges the fact that greater heterogeneity makes it more difficult for people to cooperate, it also predicts that heterogeneity greatly enhances the potential for a wider array of views and information, novel solutions, creative synthesis, and overall group performance (Gruenfeld et al., 1996; Phillips et al., 2004). Furthermore, in management groups with high levels of heterogeneity, out-group discrimination is less likely to occur because there are few common bases for subgroup formation (Early and Mosakowski, 2000). Due to the number of out-group contacts that heterogeneous group members are likely to have, they may not be seriously inhibited by social identity and categorization processes and may, instead, greatly benefit from their diverse pool of resources (Richard, Barnett, Dwyer, and Chadwick, 2004). For example, groups with heterogeneous backgrounds performed better than homogenous groups even though their responses were slower (Hambrick et al., 1996). Jehn et al. (1999) also found that heterogeneous groups had higher levels of group performance than homogeneous groups, and Bantel and Jackson (1989) found higher levels of innovation in groups that were heterogeneous than in groups that were homogenous. Thus,

***Hypothesis 4a (H4a):* Groups with high levels of heterogeneity will have high levels of performance.**

The alignment perspective predicts that faulty group processes emerging from negative categorizations across subgroups formed by faultlines may lead to severe losses in group performance. Due to additional subgroup identification, group members may be less supportive across different subgroups (Kramer, Hanna, Su, and Wei, 2001) and thus may not disclose accurate data needed to complete the task (Putnam and Jones, 1982). For example, faultline theory describes how conformity pressures arise in subgroups, causing polarization around different viewpoints and competition across them (Lau and Murnighan, 1998; Wit and Kerr, 2002). This polarization can interfere with subgroup members' willingness to make choices that benefit all group members, thus resulting in productivity losses (Polzer, Mannix, and Neale, 1998). As Lau and Murnighan note, "Although turmoil among a number of internal subgroups may be debilitating, it may not generate as much intensity as two competing subgroups that can foment diametric opposition to one another" (1998, p. 331). Therefore, we propose this hypothesis:

***Hypothesis 4b (H4b):* Groups with strong faultlines will have low levels of performance.**

MEDIATORS OF HETEROGENEITY AND FAULTLINES EFFECTS

Finally, because we have hypothesized that group heterogeneity and faultlines promote conflict and also affect team members' satisfaction and performance, we further hypothesize that the effects of both group heterogeneity and faultlines will be mediated by conflict. Organizational research has reported the negative consequences of relationship conflict for satisfaction with a team (Amason, 1996; De Dreu and Van De Vliert, 1997; Jehn, 1995, 1997). Researchers propose that the anxiety and threats produced by relationship conflict detract a group from task accomplishment (Jehn, 1997) and cause dissatisfaction among group members (Amason and Schweiger, 1994; Jehn, 1994). Moreover, when a group argues about who does what, the resulting process conflict may shift focus to irrelevant discussions of members' abilities and set off tension and personal attacks (Jehn, 1997). For example, groups with high levels of process conflict were unable to define priorities, agree on a common approach, or divide responsibility, and members were generally dissatisfied with the group (Jehn et al., 1999). Task conflict also negatively relates to team member satisfaction (Amason, 1996; Jehn, 1997; Schwenk and Cosier, 1993). Ross (1989) argues that a person's first reaction to disagreement and questioning of one's opinion is dissatisfaction, and, as such, task conflict can cause tension, anxiety, and discomfort among

group members. Given our previous arguments that faultlines will have a stronger effect on conflict and satisfaction than heterogeneity, we think there will be stronger mediated relationships with faultlines than with heterogeneity. Thus,

Hypothesis 5 (H5): All types of conflict (relationship, task, and process) will mediate the effects of group heterogeneity and group faultlines on group satisfaction; in addition, groups with strong faultlines will have stronger mediated relationships.

There has been a growing tendency in the literature to assume that task conflict can, under certain circumstances, be a positive force and improve group performance (Jehn, 1995; Jehn and Bendersky, 2003). For example, research has demonstrated that minorities who argued consistently and flexibly promoted a thorough, intensive elaboration of the problem (De Dreu and West, 2001; Moscovici, 1980; Phillips, 2003). Task conflict also counteracts the biased information seeking of consensus-based subgroups (Schultz-Hardt, Jochims, and Frey, 2002) and leads to problem solutions characterized by high levels of creativity and quality (Ancona and Caldwell, 1992; De Dreu and Van De Vliert, 1997; Nemeth and Kwan, 1987). Although the disagreements related to the task appear to stimulate the quality of group decision making and are good for performance, this positive effect breaks down quickly when task conflict is intense. A recent meta-analysis has indicated that task conflict may not always be beneficial for group performance and can, indeed, be negatively associated with performance (De Dreu and Weingart, 2003). As conflict intensifies, cognitive load increases and interferes with creative thinking and cognitive flexibility, information processing slows down, and group performance suffers. Task conflict generated by heterogeneous groups may be qualitatively different than the task conflict generated by aligned subgroups. Groups with high levels of heterogeneity will be more likely to benefit from task conflict because these groups are characterized by less competition and a more open environment. Thus, conflict generated by heterogeneity will be less intense than the conflict generated by faultlines. Because we have argued for different effects of group faultlines and heterogeneity on performance, we likewise argue for different mediating effects of task conflict. Therefore, we propose the following hypothesis:

Hypothesis 6a (H6a): Task conflict will mediate the effects of group heterogeneity on group performance; that is, the more heterogeneous the group is, the higher the level of task conflict within the group, which leads to higher levels of group performance.

Hypothesis 6b (H6b): Task conflict will mediate the effects of group faultlines on group performance; that is, the stronger the group faultlines, the higher the level of task conflict within the group, which leads to lower levels of group performance.

METHOD

RESEARCH SITE AND SAMPLE

Our sample includes 60 colocated groups from a Fortune 500 corporation in the information processing industry. We identified the work groups using a reporting system developed by the company and information about the structure of the departments provided by key senior staff members. By interview and observation, we verified that these were actual working groups (that is, they interacted frequently and were task interdependent, individual members identified each other as group members, and groups were seen by other members of the organization as work groups) in existence for, on average, more than a year. They included employees in production, sales, marketing, and distribution departments. These were all management groups involved in solving complex cognitive tasks, and the type of work they did was relatively similar across all groups. Key senior staff believed that “groups” of 1 or 2 employees or groups with more than 16 employees were not actual working groups. This is consistent with our definition of a group and with group process theories regarding group size (Goodman, Ravlin, and Argote, 1986). We also eliminated all 3-person groups since it was impossible not to have “token” splits (that is, having a “subgroup” consisting of only 1 member). Thus, we have a sample of 60 groups and 455 individuals with complete demographic and performance data. The age of employees ranged from 27 to 68 years with a mean of 47 years. Seventy-two percent of the employees were male. Most employees (88 percent) were white, 7 percent were African American, 2.7 percent were Asian, and 2.3 percent were Hispanic. The level of education ranged from grade school to the Ph.D. level; the modal level was a bachelor’s degree. Tenure with the company ranged from 1 year to 44 years with a mean of 14 years. Work functions included four distinct categories (administrative, customer service, finance, and marketing).

MEASURES

Heterogeneity

We used Blau’s (1977) heterogeneity index to measure group heterogeneity for categorical variables (that is, race, gender, function) calculated as $H = -\sum P_i^2$, where P represents the fractional share of team members assigned to a particular grouping within a given characteristic and i is the number of different categories represented on a team. We used the coefficient of variation to measure group diversity for continuous variables (for example, age, level of education) (Allison, 1978), as is common in diversity research that compares diversity across groups of different sizes (O’Reilly, Williams, and Barsade, 1998; Pelled et al., 1999; Polzer, Milton, and Swann, 2002).

Faultlines

The development of our faultline measure was motivated by Lau and Murnighan's (1998) original faultline theory suggesting that the alignment of multiple demographic attributes can potentially subdivide a group. Our faultline measure hence takes into account cumulative proportions of variance across demographic variables. This makes our measure different from a simple aggregate measure, in that it estimates how well the variability within the group can be explained by the presence of different clusters within the group (for more details see Thatcher et al., 2003; Zanutto, Bezrukova, and Jehn, 2005). We measure the *strength* of faultline splits using a multivariate measure of group similarities over several variables taken from the literature on statistical cluster analysis (Jobson 1992, p. 549). This statistic essentially measures the degree of alignment or correlation of attributes in the resulting subgroups. Faultline strength can take on values between 0 and 1, with larger values indicating greater strength. Possible values of faultline strength ranged from .318 (weak faultline strength) to .782 (very strong faultline strength) in our data set. We also measure the degree of difference between two subgroups using a multivariate distance score taken from the multivariate statistical cluster analysis (for example, Morrison, 1967; Jobson, 1992; Sharma, 1996) that is calculated as the *distance* between subgroup centroids (the Euclidean distance between the two sets of average). Faultline distance can take on values between 0 and ∞ with larger values indicating a larger distance between the subgroups. Possible values of faultline distance in our data set ranged from 1.308 (weak faultline distance) to 3.645 (very strong faultline distance). To account for the joint effect of faultline strength and distance, we multiplied the two standardized scores and used this overall group faultline score in our analyses (range: $-.59$ to 7.87). We measure group faultlines along six demographic characteristics (age, race, tenure, education, function, and gender).

Performance

Our measures of group performance were bonuses and performance ratings from the organization's archival data. Bonus amounts are the actual bonus amounts paid out for the year to an employee; these amounts are to some extent calculated on the basis of group performance. Performance ratings are the codes indicating whether the productive output of a group member meets or surpasses specific performance goals; these codes are associated with an employee's performance review (for example, 5 refers to outstanding performance, and 1 refers to unsatisfactory). Both types of performance measures indirectly reflect how well employees or groups capitalize on multiple perspectives being brought to bear on a problem. We averaged our data across groups to produce group scores of the factors and conducted all analyses at the group level. This was done to ensure that we can effectively compare our results of the effects of heterogeneity and group faultlines to the effects found in other studies. We collected evidence regarding the validity of the group-level constructs, following the

suggestions of Bliese (2000). We first conducted one-way analysis of variance and found between-group variance for all of these variables significant at either the .01 or the .001 level. To justify aggregation, we performed intraclass correlation coefficients (ICC[1]s) that estimate the proportion of variance in the variables between groups over the sum of between- and within-group variance. We obtained the following values of ICC(1)s for bonuses and performance ratings: .487 and .133, respectively. On the basis of these results, we concluded that aggregation was justified and created our group-level performance variables.

Controls

We included mean member gender (percentage of men), mean member race (percentage of white employees), and mean member age as group-level control variables. An extensive body of literature has identified the effect of gender on patterns of interaction and status (Eagly, Diekmann, Johannesen-Schmidt, and Koenig, 2004; Ferdi and Wheelan, 1992; Ng and Van Dyne, 2001; Ridgeway and Smith-Lovin, 1999) and indicated its substantial impact on various performance outcomes. We expected our race and gender controls to be associated with performance and satisfaction such that males and whites were likely to have higher levels of performance and to be more satisfied than females and more satisfied than both genders of other races (Cordero, DiTomaso, and Farris, 1996; Fenwick and Neal, 2001). For instance, men's competitive orientation and their tendencies toward more-analytical decision making explained the superior performance of mixed groups in Fenwick and Neal's (2001) study. Although the majority of our groups were predominantly white, we followed Richard et al.'s (2004) suggestion and included a proportional control variable for race; this enabled us to interpret the results of our heterogeneity variables with more confidence. Since age has an effect on strategic planning formality and often serves as a proxy for formal status that influences members' attitudes regarding performance in groups (Bantel, 1993; Bunderson, 2003), we also controlled for the mean group age. We expected mean group age to be negatively associated with group performance and positively related to satisfaction (Bantel, 1993). Other demographic variables were not correlated with our variables and were thus not included in the analyses. All controls were obtained from the company's archival files.

QUALITATIVE DATA ANALYSIS

To generate measures of conflict and satisfaction, we analyzed the content of 300 pages of company documents that were part of a program sponsored by the human resources department. As part of this program, which was designed to help managers and supervisors of work groups in their planning, employees completed "development reports" regarding their work groups. They were asked to identify the key issues

for their groups in dealing with performance gaps and to set action priorities. Since this company's program is ongoing, employees are comfortable with reporting on these issues and openly express their opinions in this common forum without retaliation or criticism. Thus, the reports capture the dominant group processes in work groups, particularly including how much conflict members have and how satisfied they are with their group experience and performance. Employees submit their information directly over the corporate intranet or via the Internet. This information is confidential and available only to the employee, his or her direct manager, and a selected group of human resources personnel in aggregate form.

We employed a content-analysis procedure that allowed us to make direct quantitative comparisons of groups using established computer-aided text analysis techniques (for example, Abrahamson and Hambrick, 1997; Jehn and Werner, 1993). Following the method of Jehn and Werner (1993), two independent raters reviewed all individual responses and coded the text for each variable of interest as defined by theory (see appendix 3.A for coding procedure and guidelines). In particular, the raters jointly went through the first few individual responses to develop the coding guidelines. (These raters, students working for credit, were unfamiliar with faultline theory and were blind to the hypotheses.) They coded the rest of the responses individually following guiding questions to evaluate each variable of interest for each individual response on 7-point Likert scales (for scale anchors, see specific variables in the following two sections). The agreements between the raters were 92, 89, 93, 97, and 90 percent on relationship conflict, task conflict, process conflict, satisfaction with group experience, and satisfaction with group performance, respectively, and were determined by checking the number of times that the raters agreed on their scores. When raters rated a response farther than 1 point apart, they discussed the response until they reached agreement and then refined their coding rules. We have further aggregated the coded individual statements to the group level and checked for within-group agreement. We obtained the following values of ICC(1)s for relationship conflict, task conflict, process conflict, satisfaction with group experience, and group performance: .861, .700, .871, .887, and .712, respectively.

Conflict

Three types of conflict (task, process, and relationship) were operationalized by content coding the company's textual data. The raters defined the extent of each type of conflict indicated by the employee on a scale from 1 (no conflict) to 7 (extreme amount of conflict). Following is an example from the data demonstrating task conflict:

Objectives need to be aligned . . . Strategic has limited input in how to achieve the revenue. Strategic does not find out what the plans or marketing programs are for achieving revenue. Everyone has their self interest and no one has an interest in a

combined goal. Lack of direction as a business unit. Not achieving our objective as a business unit.

Satisfaction

We operationalized satisfaction as satisfaction with group experience and satisfaction with group performance. Satisfaction with group experience is the extent to which individuals express a positive affective orientation toward their group (adapted from Schippers et al., 2003). Satisfaction with group performance refers to how well a member of a group believes the group as a whole does in accomplishing group tasks (Jehn et al., 1997). The raters coded both variables using a 7-point Likert scale (1 = extremely dissatisfied/negative performance; 7 = extremely satisfied/positive performance). This is an example of satisfaction with group experience:

What I like most about XXX [group's name] is all *the nice people* that work for this company. . . . I feel wanted and appreciated. *The positive people all want to help you* and get a good product out with out concern for "hidden agendas." *It lets me be myself.*

RESULTS

Because most group diversity studies have linked the effects of diversity to group performance, we employed a group level of analysis to provide a fair comparison of the two theoretical perspectives. We use multiple hierarchical regression analysis and compare the relative strength of the heterogeneity and faultlines effects using the adjusted R^2 statistic—a version of R^2 that has been adjusted for the number of predictors in a model.

Table 3.2 displays the means, standard deviations, and correlations among all variables. Race heterogeneity was negatively and significantly associated with satisfaction with group performance, whereas tenure heterogeneity was positively and significantly correlated with performance ratings and bonuses. Group faultlines were positively and significantly associated with group-level relationship conflict and were negatively and significantly correlated with bonuses and satisfaction with group experience. Relationship conflict was negatively and significantly associated with satisfaction with group performance. Task conflict was positively and significantly related to bonuses but was negatively and significantly correlated with satisfaction with group performance. Finally, process conflict was negatively associated with satisfaction with group experience and performance. We further examined the relationships among faultlines, heterogeneity, conflict, and performance using multiple hierarchical regression analyses.

Table 3.2
Means, Standard Deviations, and Zero-Order Correlations among Variables

Correlations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Race (% of white)	.887															
2. Gender (% of men)	.078	.694														
3. Mean group age	-.199	.278*	.47.189													
4. Group faultlines	.068	-.041	-.078	.661	1.351											
5. Age heterogeneity	.083	.079	-.102	.422†	.148	.056										
6. Race heterogeneity	-.986†	-.010	.229	-.075	-.092	.176										
7. Gender heterogeneity	.043	-.427†	-.022	.082	.068	-.089										
8. Tenure heterogeneity	.103	-.008	-.010	-.041	.089	-.110	.173									
9. Education heterogeneity	.143	-.004	-.276*	-.048	-.096	-.124	-.301*	-.272*								
10. Function heterogeneity	.134	.182	-.194	.130	-.020	-.124	-.154	-.119	.193							
11. Relationship conflict	-.104	.031	.023	.439†	.074	.085	-.107	-.097	-.033	-.009						
12. Task conflict	-.080	.048	.142	.228	.131	.076	.060	.166	-.219	-.133	.293					
13. Process conflict	-.086	-.174	-.040	.239	.066	.099	.043	.028	-.182	-.033	.553†	.420†				
14. Performance ratings	.085	.192	.095	-.243	-.128	-.083	-.020	.312*	-.123	.231	-.224	-.077	-.087			
15. Bonuses	-.096	.223	-.441†	-.273*	-.190	.105	-.021	.322*	-.213	-.036	-.082	.341†	-.014	.434†		
16. Satisfaction with group experience	.065	.122	.157	-.308*	-.110	-.068	.028	.007	.041	-.056	-.294	-.122	-.461†	.225	.146	
17. Satisfaction with group performance	.311†	.050	-.084	-.226	-.011	-.299*	.053	-.095	-.019	.239	-.295*	-.307*	-.361†	.199	.054	.436†

* $p < .05$

† $p < .01$

MAIN EFFECTS HYPOTHESIS TESTING

We first tested the main effects of group heterogeneity and faultlines on conflict, performance, and satisfaction (see Tables 3.3 and 3.4). Step 1 of the hierarchical regression contains controls including mean member gender, mean member race, and mean member age. Step 2 includes the main effects of either separate group heterogeneity variables (heterogeneity model) or group faultlines (faultline model). Hypothesis 1 predicted that whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup relationship conflict and low levels of satisfaction, faultlines will have a stronger effect on relationship conflict and satisfaction than will heterogeneity. There were no statistically significant relationships between our heterogeneity variables and relationship conflict or satisfaction; however, group faultlines were positively and significantly related to relationship conflict ($\beta = .436, p = .003$) and significantly and negatively related to satisfaction with group experience ($\beta = -.295, p = .037$) and satisfaction with group performance ($\beta = -.250, p = .049$) as predicted. The change in R^2 from step 1 to step 2 for the faultline model indicated a significant increase above and beyond the control variables. In general, faultlines accounted for 12 percent of the variance in relationship conflict, 5 percent of the variance in satisfaction with group experience, and almost 10 percent of the variance in satisfaction with group performance.

Hypothesis 2 predicted that whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup task conflict, faultlines will have a stronger effect on task conflict than will heterogeneity. Again, we found that although there were no statistically significant relationships between our heterogeneity variables and task conflict, group faultlines were positively and marginally significantly related to task conflict ($\beta = .245, p = .069$). The change in R^2 from step 1 to step 2 for the faultline model indicated an increase in variance explained by faultlines above and beyond the control variables at $p < .1$.

Hypothesis 3 predicted that whereas groups with high levels of heterogeneity and groups with strong faultlines will both experience high levels of intragroup process conflict, faultlines will have a stronger effect on process conflict than will heterogeneity. Our results show that there were no statistically significant relationships between our heterogeneity variables and process conflict; however, group faultlines were positively and marginally significantly associated with this type of conflict ($\beta = .239, p = .069$). The change in R^2 from step 1 to step 2 for the faultline model indicated an increase above and beyond the control variables at $p < .1$.

In support of hypothesis 4a predicting that groups with high levels of heterogeneity will have high levels of performance, we found that tenure heterogeneity was significantly and positively associated with both group bonuses and performance ratings ($\beta = .348, p = .006$ and $\beta = .332, p = .014$, respectively), and functional

Table 3.3
Hierarchical Multiple Regressions Predicting Group-Level Conflict

	Relationship Conflict		Task Conflict		Process Conflict	
	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model
<i>Step 1: Controls</i>						
Race		-.110	-.055			-.075
Gender		.040	.018			-.166
Mean age		-.013	.125			-.009
R ²		.012	.023			.036
Adjusted R ²		-.058	-.031			-.016
F		.117	.425			.692
<i>Step 2: Main effects</i>						
Group faultlines	.436‡			.245†		.239†
Gender heterogeneity		-.328			-.024	-.092
Age heterogeneity		.102			.122	.084
Race heterogeneity		-.989			-.216	1.305
Education heterogeneity		-.133			-.125	-.247
Tenure heterogeneity		-.126			.122	-.014
Function heterogeneity		.043			-.063	.037

(continues)

Table 3.3 (continued)
Hierarchical Multiple Regressions Predicting Group-Level Conflict

	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model
<i>Step 2: Main effects (cont.)</i>						
Change in R^2	.188	.066	.059	.068	.057	.084
F change	9.623‡	.429	3.436†	.600	3.433†	.800
R^2	.200	.078	.083	.091	.092	.120
Adjusted R^2	.122	-.152	.013	-.079	.026	-.038
F	2.566†	.340	1.192	.535	1.400	.759

* $p < .05$

† $p < .1$

‡ $p < .01$

Table 3.4
Hierarchical Multiple Regressions Predicting Group-Level Outcomes

	Group Performance (bonuses)	Group Performance Ratings	Satisfaction with Group Experience	Satisfaction with Group Performance
<i>Step 1: Controls</i>				
Race	-.024	.085	.096	.302*
Gender	.113	.167	.086	.036
Mean age	.405‡	.065	.168	-.033
R^2	.206	.045	.043	.098
Adjusted R^2	.163	-.006	-.017	.050
F	4.842‡	.889	.720	2.038

(continues)

Table 3.4 (continued)
Hierarchical Multiple Regressions Predicting Group-Level Outcomes

	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model	Faultline Model	Heterogeneity Model
<i>Step 2: Main effects</i>								
Group faultlines	-.237*		-.239†		-.295*		-.250*	
Gender heterogeneity		-.013		.000		.188		.012
Age heterogeneity		-.193†		-.172		-.095		-.041
Race heterogeneity		-.434		-.465		-.783		.411
Education heterogeneity		-.030		-.074		.128		-.111
Tenure heterogeneity		.348‡		.332*		.038		.024
Function heterogeneity		.065		.267*		-.091		.222
Change in R^2	.056	.153	.057	.194	.086	.057	.062	.054
F change	4.161*	1.994†	3.462†	2.124†	4.629*	.447	4.059*	.534
R^2	.262	.359	.102	.239	.129	.100	.160	.153
Adjusted R^2	.208	.244	.037	.102	.055	-.092	.099	.000
F	4.877‡	3.115‡	1.562	1.748	1.738	.521	2.627*	1.002

* $p < .05$ † $p < .1$ ‡ $p < .01$

heterogeneity was again positively related to performance ratings ($\beta = .267$, $p = .049$). In contrast, age heterogeneity was marginally significantly and negatively associated with group bonuses ($\beta = -.193$, $p = .100$). Supporting hypothesis 4b, groups with strong faultlines had low levels of bonuses and performance ratings. This difference was statistically significant for bonuses ($\beta = -.237$, $p = .046$) and for performance ratings at $p < .1$ ($\beta = -.239$, $p = .068$). Whereas the changes in R^2 from step 1 to step 2 for the faultline model indicated a significant increase above and beyond controls in both group bonuses and performance ratings, the changes in R^2 for the heterogeneity model were only significant at $p < .1$. In general, heterogeneity accounted for 24.4 percent of the variance in group bonuses and 10.2 percent of the variance in performance ratings, and faultlines accounted for 20.8 percent of the variance in bonuses and 3.7 percent of the variance in performance ratings.

To examine the relative importance of group faultlines and group heterogeneity simultaneously on group processes and performance, as well as to compare the utility of the heterogeneity model in addition to the faultline model, we performed two sets of additional analyses (not included in the tables). First, we included our faultline variable together with all heterogeneity variables in the regression equation and reran the analyses. Second, we conducted a series of hierarchical regression analyses comparing the baseline models with heterogeneity variables and *without* faultlines, with the models including both heterogeneity and faultline variables. The results were virtually identical to those we reported previously, except that faultlines explained 20, 4.9, 4.6, 2.8, 4.5, 7.8, and 8.8 percent of the variance in relationship conflict, task conflict, process conflict, bonuses, performance ratings, satisfaction with group experience, and satisfaction with group performance, respectively, *above and beyond* the heterogeneity variables. Following the procedure suggested by Jehn et al. (1999) and widely used in recent demography research (Schippers et al., 2003), we also averaged age, race, tenure, level of education, functional background, and gender heterogeneity variables to arrive at our overall group heterogeneity measure. The effect of this variable was significant with performance ratings at $p < .1$ ($\beta = .238$, $p = .090$).

TESTING THE MEDIATING EFFECTS OF CONFLICT

Hypothesis 5 predicted that all conflict types (relationship, task, process) would mediate the effects of group heterogeneity and faultlines on group satisfaction; in addition, groups with strong faultlines would have a stronger mediated relationship. Using the procedure suggested by Baron and Kenny (1986), we found that heterogeneity variables were not significantly related to any of our conflict variables, and thus the mediating role of relationship, task, and process conflict between heterogeneity and satisfaction variables was not confirmed. Group faultlines, in turn, were significantly associated at $p < .01$, $p < .5$, or $p < .1$ with all types of conflict and both satisfaction variables. Whereas the mediating role of relationship conflict between group faultlines

and satisfaction was not confirmed for any of the satisfaction variables, the mediating role of process conflict was confirmed for both satisfaction variables, and the partial mediating role of task conflict was confirmed for satisfaction with group performance. When controlling for process conflict, we found that the significant effect of group faultlines on satisfaction with group experience and group performance became non-significant (n.s.) ($\beta = .120$ [n.s.] and $\beta = .151$ [n.s.], respectively), and the effect of the mediator remained strong ($\beta = -.406$, $p = .004$ and $\beta = -.299$, $p = .020$, respectively). When controlling for task conflict, we found that the significant effect of group faultlines on satisfaction with group performance became nonsignificant ($\beta = .119$ [n.s.]) and the effect of the mediator remained ($\beta = -.258$, $p = .041$).

Hypotheses 6a and 6b predicted that task conflict would mediate the effects of group heterogeneity and group faultlines on group performance in the opposite directions. Because heterogeneity variables were not significantly related to task conflict, the mediating role of task conflict between heterogeneity and outcome variables was not confirmed. Group faultlines, in turn, were associated with task conflict and performance outcomes at $p < .05$ or $p < .1$. However, Baron and Kenny's (1986) test of mediation failed to confirm the mediating role of task conflict between faultlines and performance.

DISCUSSION

The objective of this research was to compare dispersion and alignment theoretical approaches to group composition and to examine group faultlines and heterogeneity. We undertook this effort to explain missing variance inherent in past diversity studies that only considered group heterogeneity. We tested Lau and Murnighan's (1998) arguments regarding faultlines using 60 groups from a Fortune 500 company. In the following paragraphs, we discuss our results and summarize how our study extends prior research on diversity and conflict.

DISCUSSION OF RESULTS AND CONTRIBUTIONS

In this study, we hypothesized that because faultlines highlight the presence of clear subgroup distinctions across demographic variables within the larger group, they would be a better predictor of processes and performance than heterogeneity. Our results show relationships between faultlines and conflict (significant with relationship conflict at $p < .01$ and with task and process conflicts at $p < .1$) but no statistically significant relationships between heterogeneity and conflict variables. These findings support the original faultline model (Lau and Murnighan, 1998), which suggested that subgroups resulting from group faultlines lead to more salient conflictual relationships. For example, differences in heterogeneous groups may lead to perceptions of certain types of conflict, but because there may be crosscutting character-

istics, the polarization and conflict escalation that occur in groups with faultlines may not emerge. Previous diversity research has also shown that differences alone may not strongly influence conflict in ongoing work groups (for example, Ely and Thomas, 2001; Watson et al., 1993). The reason is that differences in some characteristics can be offset by similarities in others, thereby mitigating potential conflicts. This may be the case in our work groups and consequently may be one reason for the effects we observed. In fact, our follow-up analyses demonstrated that group faultlines explained 20, 4.9, and 4.6 percent of the variance in relationship conflict, task conflict, and process conflict, respectively, above and beyond heterogeneity variables.

We were surprised by the fact that group heterogeneity did not have any significant effects with any of our satisfaction variables. One would envision that each dimension of heterogeneity may in principle elicit social-categorization processes and predictable reactions with affective outcomes. However, consistent with Knippenberg, De Dreu, and Homan's (2004) assertion that there are more-complex relationships between heterogeneity and categorization, one explanation for this observed effect is that perhaps the salience of social categorization may not be fully realized in our heterogeneous groups. Heterogeneity does not take into account an overlap among individuals and group membership (for example, person 1 is similar to person 2 on age but is also similar to person 3 on gender) as do faultlines. Unlike the heterogeneity effects and as we predicted, our results indicate statistically significant relationships between faultlines and satisfaction variables. In such groups, individuals must truly feel that the us versus them distinction negatively colors their group experience.

In line with reviews on group diversity (Jackson et al., 2003; Webber and Donahue, 2001; Williams and O'Reilly, 1998), our analyses showed somewhat mixed and inconsistent effects of heterogeneity with objective performance. We found that members of groups heterogeneous in age had lower levels of group performance, whereas members of groups heterogeneous in functional background and tenure had higher levels of group performance. These findings closely align with and support two theoretical arguments currently prevailing in the diversity literature. Problems that arise from perceived differences amongst members of groups heterogeneous in age may interfere with performance (for example, Pelled, 1996), whereas the breadth of perspectives that functionally diverse group members embrace may enhance performance (for example, Gruenfeld et al., 1996).

Our results regarding performance and faultlines are more consistent. Groups with strong demographic alignments had low levels of group bonuses and performance ratings, supporting our predictions that group faultlines lead to performance losses. Members of such groups are more likely to affiliate themselves with their respective subgroups and thus be less concerned with the success of the larger group (Workman, 2001). We argue that this is due to the added polarization of the subgroups as more attributes are aligned. One interesting observation is that our

results showed only significant at $p < .1$ effects of group faultlines on performance ratings compared with bonuses; thus, we realize that our performance measures may be differently affected by antecedent predictors, some more strongly than others. One reason for this, for example, is that group bonuses are based on hard performance numbers, whereas performance ratings indicate a subjective perception of a group's performance by its supervisor, who may conform to certain types of norms and values. Thus, bonuses more accurately reflect how group composition and process influence actual behavior than do performance ratings, which are more subjective. Unfortunately, we do not have detailed information on the nature of our performance ratings to provide a more elaborate discussion of the effects we observed.

To compare the utility of the heterogeneity model in addition to the faultline model, we performed follow-up analyses and found that faultlines explained 2.8 and 4.5 percent of the variance in bonuses and performance ratings, respectively, above and beyond all heterogeneity variables. One might argue that statistical power is an issue and that a fair comparison test should include an equal number of variables; thus, we explored this possibility by aggregating our heterogeneity variables (Jehn et al., 1999; Schippers et al., 2003) and rerunning the analyses. When we tested the two models simultaneously, the effect of the heterogeneity variable was not significant with bonuses and was only significant at $p < .1$ with performance ratings ($\beta = .238$, $p = .090$), whereas the effects of faultlines were statistically significant for both performance variables ($p < .05$). In additional analyses, faultlines explained 6.8 and 8.1 percent of the variance in bonuses and performance ratings, respectively, above and beyond the aggregated heterogeneity variable. Our general proposition predicting that group faultlines will be a better predictor of performance than group heterogeneity was thus supported. These results indicate that it is the alignment, and not only the dispersion, of demographic characteristics that strongly influences group processes and performance.

Whereas no mediation was confirmed for any of our heterogeneity variables, we found some empirical support for mediation among group faultlines, task and process conflict, and satisfaction. In general, our results showed that strong faultlines intensify task and process conflict in a group, which then decreases satisfaction. These findings are particularly interesting in their relevance to process conflict. Despite its theoretical importance, process conflict has been the least understood and examined of the three types of conflict (Behfar et al., 2005; chapter 1, this volume). The majority of diversity research has focused on the relationship/task distinction of conflict (for an exception, see Jehn et al., 1999). We believe it is critical to examine task and process conflict as separate constructs to improve the explanatory power of models of group diversity. We hence contribute to conflict literature not only by looking at how demographic alignment explains conflict but also by considering process conflict separately from task conflict.

Our methodological contribution to existing research on group composition and faultlines is in comparing the predictive power of heterogeneity variables with faultline variables on group processes and performance. We conceptualize diversity in two ways: group heterogeneity (the degree of dispersion of demographic attributes) (Blau, 1977) and group faultlines (the alignment of demographic attributes) (Lau and Murnighan, 1998). We demonstrate that using two different conceptualizations of diversity on the same data set provides different patterns of results, and we explain these differences theoretically. Lastly, to our knowledge, this study provides one of the first empirical tests of group faultline theory using organizational data, and it validates predictions about the effects of demographic faultlines on conflict and performance.

LIMITATIONS

The strengths of the current research (data collected from an actual workplace setting) are accompanied by potential weaknesses. Some limitations of this study are common to demography studies that use archival file data. First, whereas we were able to construct reliable measures of group process variables using content analysis of company documents, no direct measures of process variables were available. Second, one may raise the question of the objectivity of employees' comments as they were going to be used by managers and supervisors in future planning. Although this question is reasonable, we believe that these comments are a relatively objective reflection of dominant group processes. As part of an ongoing and supportive planning process program, employees were asked to identify the key issues and problems in their groups, and their responses reveal that they were quite comfortable reporting their opinions regarding these issues. Furthermore, employees who were more proactive in reporting on the intranet may also have a stronger influence on the computation of the measure than those who were less proactive. However, we believe our study has an advantage over many archival studies because we had relevant text data on team processes, something often missing in large archival data sets.

Next, there were limitations in the data regarding control variables. For instance, an important control variable would be how long a team has been together. Although we do not have any specific data on the life span of these groups, we do have some evidence from a company contact that these groups are not newly formed and they all have been in existence for at least one year. Task interdependence is another important control variable. From a company source and interviews with a few key managers, we verified that the groups in our sample interacted on a regular basis and were task interdependent. However, we could not obtain any specific survey data, for example, regarding how frequently (for example, number of interactions per day) and in what capacities these groups interacted. In addition, the effects of diversity on performance may be positive or negative depending on the type of task. Despite the fact that no specific data were available regarding the task type, we reex-

amined our text files and found that all teams were management groups that had certain nonroutine task characteristics and showed no significant variation on task type across groups.

In a recent meta-analytical study, De Dreu and Weingart (2003) demonstrated that the positive effects of task conflict break down quickly when conflict becomes intense. Our findings support the argument that task conflict may interfere with group processes and result in less satisfaction with group performance. Much debate has taken place about whether task conflict is beneficial (for example Jehn, 1995; Schultz-Hardt et al., 2002) or detrimental for performance and satisfaction (cf., De Dreu and Weingart, 2003). Our study provides some insight into this important question.

PRACTICAL IMPLICATIONS

It is often assumed that well-managed diverse work groups can serve as a catalyst to enhance the contributions of individual employees. This research attempts to deconstruct such generalities as “good diversity management” and specifically examine when and how diverse teams produce either beneficial or poor results. Our findings show that an alignment across group members and the resulting demographically motivated subgroups may be more important than just the heterogeneity of demographic characteristics in predicting group processes and performance of organizational work groups. We hope this knowledge will assist managers and group leaders in day-to-day supervision of diverse organizational work groups and will better equip them to effectively handle the dynamics of diverse groups by minimizing the chances that subgroups are demographically motivated.

On the basis of our results, we recommend that managers strive to be aware of nuances of group composition and the potentially harmful effects of faultlines that divide groups into homogenous subgroups along demographic lines. One way to accomplish this is to encourage employees in diverse groups to participate in boundary-spanning activities across potential faultlines. By exercising project management or job rotation, managers can promote the creation of temporary teams for particular tasks that cut across groups and departments and thus potentially break down demographically aligned subgroups. Similar effects can be achieved through encouraging task-related networks that provide meaningful functions a group can perform (for example, setting up a recruitment or orientation task force). This is in contrast to a popular organizational practice of promoting more-peripheral social clubs, which may reinforce stereotypes. Another positive managerial practice would be to force conflict resolution when needed. For example, managers of groups with strong faultlines may want to initially promote task conflict and process conflict so as to generate high-quality ideas. Managers should then be active in bringing resolution to these conflicts and introducing ways the group can create boundary spanning across the subgroups. Thus, it is possible to manage some of the potential benefits

and problems of faultlines if one is aware of the effect of group composition on group process and performance. Taking these steps will help managers maximize the productivity of their increasingly diverse workforce without being fearful of diversity.

NOTES

1. We would like to note that whereas relational demography research may also fall under the framework of dispersion, we focus our discussion on group-level theories.

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APPENDIX 3.A: CONTENT ANALYSIS RULES

I. Coding procedure

1. Two raters were given the definitions of terms and guiding questions.
 - a. Definitions: “Relationship conflict is defined as disagreement over personal issues not related to work.” “Task conflict is defined as disagreement about task-related issues (for example, viewpoints, opin-

ions).” “Process conflict is defined as disagreement about process-related issues (for example, work approaches, methods, responsibilities).”

- b. Questions for the raters: (i) What is the intensity of the relationship conflict? (ii) What is the intensity of the task conflict? (iii) What is the intensity of the process conflict? (iv) To what extent are group members satisfied with the group work? (v) To what extent are group members satisfied with their group performance?
2. Two raters coded the documents:
 - a. Two raters jointly went through the first 10 individual responses to develop the initial rules (see II. Guidelines for examples) and to clarify construct definitions.
 - b. They went through all the responses to find extreme examples of conflict, satisfaction with group experience, and satisfaction with group performance (both high and low ends) to indicate the scale range.
 - c. The raters individually rated these examples (on a scale from 1 = the least to 7 = the most) and then discussed their scores to sort out any discrepancies.
 - d. The raters independently rated the next 30 responses, compared their responses, and discussed responses that they scored farther than 1 point apart; if necessary, they refined their rules.
 - e. Finally, two raters scored the rest of the responses.
- ## II. Guidelines
1. The unit of analysis is the entire individual response; use all context available in the response to arrive at the score.
 2. Base your decision on all relevant statements indicating the variable being scored; highlight the key sentences (example for task conflict: “. . . Objectives need to be aligned . . . Strategic has limited input in how to achieve the revenue. Strategic does not find out what the plans or marketing programs are for achieving revenue. . .”).
 3. Assign a missing value to a response that has an unusually low level of comprehensibility due to incomplete or poor sentence structure or grammar and spelling mistakes (for example, a rater cannot understand what the person is saying).
 4. When scoring the response for the variable, first, place it within a range of low/extremely negative to moderate/neutral (scores from 1–4) or moderate/neutral to high/extremely positive (scores from 4–7). Second, compare the response to other responses with scores within the same range and choose the respective score based on the comparison.