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Bridging Faultlines by Valuing Diversity: Diversity Beliefs, Information Elaboration, and Performance in Diverse Work Groups

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Although there are numerous potential benefits to diversity in work groups, converging dimensions of diversity often prevent groups from exploiting this potential. In a study of heterogeneous decision-making groups, the authors examined whether the disruptive effects of diversity faultlines can be overcome by convincing groups of the value of diversity. Groups were persuaded either of the value of diversity or the value of similarity for group performance, and they were provided with either homogeneous or heterogeneous information. As expected, informationally diverse groups performed better when they held pro-diversity rather than pro-similarity beliefs, whereas the performance of informationally homogeneous groups was unaffected by diversity beliefs. This effect was mediated by group-level information elaboration. Implications for diversity management in organizations are discussed.

Keywords: diversity, faultlines, diversity beliefs, information elaboration, team performance

When important decisions have to be made, organizations often turn to groups. Especially when group members differ with respect to the information and expertise they bring to the table, groups may outperform individuals in terms of the quality of the decisions they reach (Argote, Gruenfeld, & Naquin, 2000; Ilgen, 1999; see also Hinsz, Tindale, & Vollrath, 1997). Organizations therefore increasingly rely on cross-functional work groups and project teams in an attempt to stimulate innovation, solve problems, and make decisions. Often, informational diversity within such teams comes hand in hand with differences on other dimensions, such as demographic characteristics and deeply held values and beliefs (Harrison, Price, & Bell, 1998; Jehn, Northcraft, & Neale, 1999; Milliken & Martins, 1996; Phillips, 2003; Williams & O'Reilly, 1998). When different dimensions of diversity converge (e.g., when all team members with technical expertise are male and those with knowledge about marketing and sales are female), so-called diversity faultlines emerge that may disrupt group processes (Lau & Murnighan, 1998).

A number of studies have documented negative effects of diversity faultlines on group functioning (e.g., Homan, van Knippenberg, Van Kleef, & De Dreu, in press; Lau & Murnighan, 2005; Phillips, Mannix, Neale, & Gruenfeld, 2004; Thatcher, Jehn, & Zanutto, 2003). Accordingly, diversity faultlines are generally believed to have a negative impact on group processes and performance (for a review, see van Knippenberg & Schippers, 2007). In this article, we challenge the widely shared assumption that groups with diversity faultlines cannot benefit from their informational diversity (cf. Jehn et al., 1999) by focusing on the role of group members' beliefs about diversity. We argue and show experimentally that groups with diversity faultlines may effectively use their informational diversity when group members believe in the value of diversity.

Informational Diversity and Diversity Faultlines

Informational diversity is defined as "differences in knowledge bases and perspectives that members bring to the group" (Jehn et al., 1999, p. 743); it also has been referred to as *functional* or *knowledge diversity* (Pelled, Eisenhardt, & Xin, 1999; Phillips et al., 2004). Van Knippenberg, De Dreu, and Homan (2004) argued that informational diversity can enhance group performance by stimulating the elaboration of task-relevant information and perspectives (see also Cox, Lobel, & McLeod, 1991). Building on the conceptualization of groups as information processors (Hinsz et al., 1997), van Knippenberg, De Dreu, and Homan defined *group information elaboration* as the exchange of information and perspectives, individual-level processing of the information and perspectives, feeding back the results of this individual-level processing into the group, and discussion and integration of their implications. This deeper and more extensive consideration of task-relevant information may lead diverse groups to outperform more homogeneous groups on tasks with clear information-processing and decision-making requirements (e.g., Bowers, Pharmer, & Salas, 2000; De Dreu, 2007; Jehn et al., 1999; Scholten, van Knippenberg, Nijstad, & De Dreu, in press).

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As an example of this process of elaboration in diverse groups, consider cross-functional surgical teams consisting of surgeons, radiologists, anaesthetists, and surgical nurses. High-quality performance requires that team members use their own expertise to inform the other team members about the different issues involved in the specific operation (e.g., how long the operation will take, what kind of surgical instruments are needed, where the fracture is); carefully process the information, opinions, and perspectives introduced by other team members to understand the implications for their own area of medical expertise; feed these implications back to the team; and integrate these implications to provide the best possible care for the patient.

Although diverse perspectives within a team can lead to enhanced team functioning through information elaboration, this effect may be reduced or even reversed when informational diversity converges with other diversity dimensions such as gender, personality differences, or attitudes and values. When different dimensions of diversity converge, the covariation of differences creates a diversity faultline that may elicit subgroup categorization—an "us–them" distinction (Lau & Murnighan, 1998; van Knippenberg, De Dreu, & Homan, 2004; cf. Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Such subgroup categorizations can disrupt group processes by rendering group members less trusting of and motivated to cooperate with other group members and less committed to the group, increasing interpersonal tensions and conflict, and lowering communication (e.g., Earley & Mosakowski, 2000; Lau & Murnighan, 2005; Li & Hambrick, 2005; for a review, see van Knippenberg & Schippers, 2007). Thus, although diversity may stimulate group performance through information elaboration, it also may undermine group performance through social categorization processes (Williams & O'Reilly, 1998); the latter is more likely to occur when dimensions of diversity converge to create diversity faultlines. However, and in contrast to this commonly accepted view, we propose that the performance of groups with diversity faultlines need not necessarily be impeded. Rather, we argue that the performance of such groups depends on group members' beliefs about the value of diversity.

Diversity Beliefs

Several authors have noted that people may differ in their beliefs about and attitudes toward diversity (Hostager & De Meuse, 2002; Strauss, Connerley, & Ammermann, 2003; van Knippenberg & Haslam, 2003), and that organizational climates and cultures may differ in the extent to which they value diversity (Cox, 2003; Ely & Thomas, 2001; Jackson & Associates, 1992; Kossek & Zonia, 1993; Mor Barak, Cherin, & Berkman, 1998). These studies have advanced the theoretical notion that beliefs, attitudes, climates, or cultures valuing diversity are needed to harvest the benefits of diversity, and have focused on the measurement and the determinants of diversity beliefs, attitudes, and climates. So far, however, a quantitative test of the influence of diversity beliefs and related constructs on group processes and performance in diverse teams has not been conducted. The present study provided such a test.

Diversity beliefs can be defined as beliefs about the value of diversity to work group functioning (van Knippenberg & Haslam, 2003). Contingent on such beliefs, diversity may affect the extent to which one's own work group is perceived as being a good group, where *good* may refer to (expectations of) task performance as well as to other aspects of group functioning. Diversity beliefs, thus, may inform responses to work group diversity and lead people to respond more favorably to work group diversity the more they believe in the value of diversity for work group functioning (van Knippenberg, Haslam, & Platow, 2004). In support of this proposition, van Knippenberg, Haslam, and Platow (2004) showed in a survey and a laboratory experiment that the relationship between diversity and group members' identification with their work group was moderated by diversity beliefs. When individuals believed that diversity was beneficial for the task at hand, diversity was positively related to group identification, whereas diversity tended to be negatively related to identification when individuals believed in the value of similarity. In a similar vein, in a qualitative study, Ely and Thomas (2001) observed that when an organization's perspective on diversity emphasized cultural diversity as a valuable resource for the organization, members reported feeling more valued and respected, reported a higher quality of intergroup relations, and felt that they were more successful than when the organization's perspective was not focused on the potential value of diversity.

Pro-diversity beliefs may thus remove an important barrier for diverse groups to benefit from their informational diversity. Van Knippenberg, De Dreu, and Homan (2004) proposed that intergroup biases engendered by subgroup categorization disrupt the elaboration of task-relevant information in diverse groups and, thus, stand in the way of groups' effective use of their informational resources. They further argued, however, that salient subgroup categorizations (i.e., in a team with diversity faultlines) need not necessarily elicit intergroup bias. Pro-diversity beliefs (as compared with pro-similarity beliefs) may lead group members to respond favorably to the group and its diverse membership. Pro-diversity beliefs may thus increase the likelihood that groups benefit from their diversity by inviting group members to actively solicit new information and perspectives from fellow group members and, thereby, stimulate performance.

The Present Study

Previous work has suggested that when diversity is seen as valuable to group functioning, group members may respond more positively to diversity. In the present study, we extended this line of work by providing a quantitative test of the effects of diversity beliefs on groups' use of their informational diversity. Because the potential positive effects of informational differences are more likely to be impeded when dimensions of diversity combine to form a faultline (Lau & Murnighan, 1998), we focused on groups with a diversity faultline. It has been found that in teams with a strong faultline, the negative effects of diversity in general outweigh the positive effects (e.g., Gibson & Vermeulen, 2003; Lau & Murnighan, 1998; Thatcher et al., 2003). We thus tested the impact of diversity beliefs in a context in which disruptive effects might be expected in the absence of pro-diversity beliefs.

The positive effects of work group diversity on group performance are likely to emerge primarily in groups performing relatively complex tasks that require information processing, creativity, and collaborative decision making, where the exchange of diverse task-related information and perspectives may stimulate groups' thorough consideration of the task at hand (Bowers et al., 2000; Jehn et al., 1999; van Knippenberg, De Dreu, & Homan,

2004). We, therefore, tested the interactive effects of diversity beliefs and informational diversity in a group decision-making context. We hypothesized that, even under faultline conditions, groups may make good use of informational diversity when they hold beliefs favoring group diversity rather than homogeneity. Because especially informationally diverse groups need to elaborate task-relevant information and perspectives to perform well (i.e., they need to exchange and integrate diverse information and perspectives that are already shared in informationally homogeneous groups), we expected performance to be affected more by diversity beliefs in informationally diverse groups than in informationally homogeneous groups. On the basis of this reasoning, we advanced the following three hypotheses:

> *Hypothesis 1:* Diversity beliefs moderate the effect of informational diversity on group performance. Informationally diverse groups perform better when group members believe in the value of diversity rather than similarity, whereas the performance of informationally homogeneous groups is less affected by diversity beliefs.
>
> *Hypothesis 2:* Diversity beliefs moderate the effect of informational diversity on elaboration of task-relevant information. Informationally diverse groups engage in more elaboration of task-relevant information when group members believe in the value of diversity rather than similarity, whereas elaboration in informationally homogeneous groups is less affected by diversity beliefs.
>
> *Hypothesis 3:* The effect of diversity beliefs on performance in informationally diverse groups is mediated by elaboration of task-relevant information.

These hypotheses were tested in an experimental study of four-person groups that worked interactively on a complex decision-making task in which they had to generate decision alternatives and decide about the alternatives adopted. We adopted an experimental approach for two reasons. First, testing our hypotheses in an experimental setting allowed us to draw conclusions about causality. Second, this approach allowed us to directly assess relevant group processes through behavioral coding of audio and video recordings of group interaction, rather than having to rely on the retrospective self-report data that are more customary in field research. This method thus yielded a more direct and objective assessment of the group processes leading to group performance (Weingart, 1997).

Method

Sample and Design

A total of 184 students (92 women and 92 men) of the University of Amsterdam participated in the experiment for course credit or monetary compensation (10 euro, approximately $12 U.S.). The mean age of the participants was 21 years. The participants were randomly assigned to gender-diverse 4-person groups (always consisting of 2 men and 2 women), and these groups were then randomly assigned to one of the conditions of a 2 (informational diversity: heterogeneity vs. homogeneity) × 2 (diversity beliefs: pro-similarity vs. pro-diversity) factorial design. A total of 46 groups participated in the experiment. One group could not be videotaped because of technical problems.

The Task

The task required groups to generate and select ideas. The task was inspired by a decision-making task developed by Johnson and Johnson (1982). Groups were instructed to come up with as many useful items as possible needed to survive in a desert on the basis of information provided to them before the task. The only rules were that (a) the items should be portable and (b) participants had to explain why the selected items were important for surviving in a desert. The groups thus had to work on a list of high-quality options by generating options, discussing them, and determining which options were good enough to put on the list. A pretest showed that this task was not gender related.[1]

Procedure

Creating a faultline. On arrival, participants were seated in a room in same-gender pairs. At this time, they could not see the other two group members. Participants individually read instructions stating that the study aimed to determine the effect of personality on cooperation. Then, the participants were asked to fill out a personality test. After filling out the questionnaire, their answers were supposedly analyzed, and their personality type determined. After about 10 min, the experimenter returned with the results. The bogus feedback that male participants received stated that they had an "M" personality type. Female participants received bogus feedback stating that they had an "F" personality type. They then received some superficial information about their personality type. The description of the personality type consisted of eight gender-specific traits (e.g., strong, adventurous for men; emotional, considerate for women; Willemsen & Fischer, 1999). Next, the participants read that there was a chance that they would be working in a group with people with a different personality type, and they were given three traits of people with a different personality type (e.g., women read that people with an M personality type were adventurous).

Finally, seating was used to make the faultline more salient. After participants had read the information about the task, they were seated in a new room in which the group would perform the task. Same-gender group members were always seated next to each other at a rectangular table, facing the opposite-gender members. Such converging of diversity dimensions (i.e., gender, [bogus] personality feedback, seating) results in high within-subgroup similarity and high between-subgroups differences, which makes subgroup categorization more likely (Gaertner, Mann, Murrell, &

[1] A pretest with 23 students who did not participate in the main study showed that there was no difference between men and women on task performance, suggesting that the task was not gender related, $F(1, 22) = 0.29$, *ns*, $\eta^2 = .01$. Also, we assessed whether the participants themselves perceived performance on the task to be gender related (i.e., more "male" or more "female"). A *t* test showed that perceptions ($M = 4.22$, $SD = 0.90$) did not differ from the midpoint of the scale, $t(22) = 1.16$, *ns*, indicating that participants did not perceive the task to be gender related. Again, we found no difference in responses between men and women, $F(1, 22) = 0.91$, *ns*, $\eta^2 = .10$.

Dovidio, 1989; Turner et al., 1987; van Knippenberg, De Dreu, & Homan, 2004). We thus created a perfect faultline in the sense that differences in gender, (bogus) personality feedback, and seating arrangement were perfectly correlated (cf. Lau & Murnighan, 1998; Thatcher et al., 2003). Previous research has shown that this specific convergence of diversity attributes elicits a strong faultline and evokes disadvantageous group processes (Homan et al., in press).

Manipulation of informational diversity. Then, participants received the instructions for the decision-making task and some information about surviving in the desert. This information was used to manipulate informational diversity. On the basis of expert information (Johnson & Johnson, 1982), 12 different categories of information concerning surviving in a desert were distinguished (e.g., make sure you do not dry out, create shade, batteries overheat in the heat). In the information package, these 12 different categories were mentioned in such a way that thoughtful use of the information could help in determining which items would be useful for surviving in a desert. We used standard procedures to manipulate the homogeneous versus heterogeneous information within the groups (see, e.g., Gruenfeld, Mannix, Williams, & Neale, 1996; Stasser & Titus, 1985). In the informationally homogeneous condition, all group members individually received the 12 different categories of information (i.e., all the available information was shared among all the group members). In the informationally diverse conditions, 8 of these categories of information were divided into two equally informative parts (Part A and Part B).[2] Two group members received Part A, and two group members received Part B. Same-gender group members always received the same information (further enhancing the faultline). The 4 remaining information items were given to all group members. The individual group members in the informationally diverse conditions thus received 8 information items. Four of these items were given to all four group members, 4 information items were given only to the female group members, and 4 information items were given only to the male group members. At the group level, the group thus received 12 items of information (i.e., 4 shared items + 4 items for the male members + 4 items for the female members). In other words, groups in all conditions received the same set of information; only the distribution of information across group members differed between conditions.

Manipulation of diversity beliefs. After the personality test and before the decision-making task, participants received some additional information about working in teams. Through this information, we manipulated diversity beliefs. Groups in the pro-diversity beliefs condition read that research had shown that gender-diverse groups typically perform better on decision-making tasks and experience more pleasant group processes than gender-homogeneous groups. Conversely, groups in the pro-similarity beliefs condition read that research had shown that gender-homogeneous groups typically perform better on decision-making tasks and experience more pleasant group processes than gender-diverse groups. Following this information, the participants received a short introduction to the task and some feedback about their personality type. Finally, participants were given a questionnaire to check the manipulation of diversity beliefs. After reading all the information, the participants were brought to another room and were seated together. They were then given 30 min to work on the decision-making task. Groups were videotaped during interaction. On completion of the task, the experimenter administered a questionnaire to check the manipulation of informational diversity. Then, participants were debriefed and thanked.

Dependent Variables

Manipulation checks. We checked the manipulation of informational diversity with four items (e.g., "During the group task, the group members regularly said things I did not know"). Principal components analysis (PCA) revealed that these four items all loaded on one factor (factor loadings between .80 and .84). Reliability analysis showed that the four questions formed a reliable scale ($\alpha = .86$; $M = 3.48$, $SD = 1.19$). We checked the manipulation of diversity beliefs with four items (e.g., "Groups that are diverse on gender usually perform better than groups that are homogeneous on gender"). PCA revealed that these four items all loaded on one factor (factor loadings between .82 and .84). The four items formed a reliable scale ($\alpha = .86$; $M = 4.22$, $SD = 1.42$). All responses were given on Likert-type scales ranging from 1 (*totally disagree*) to 7 (*totally agree*).

Performance. Performance was determined by calculating the mean score per item for each group. In the original task, 12 categories of items were distinguished. On the basis of these categories, we developed a coding scheme by which performance could be calculated. Better items (i.e., items that were ranked higher in the expert ranking reported by Johnson & Johnson, 1982) received a higher score, with the highest possible score being 12 points. For example, when the group decided that it would bring a magnetic compass, it received a score of 1 because the information clearly indicated that groups should not walk. Two independent raters coded the items generated by the groups, providing overlapping ratings of 21% of the groups to determine interrater agreement. We assessed interrater reliability by computing intraclass correlations (ICCs; Shrout & Fleiss, 1979). The average ICC for the two raters was .91, which is considered excellent according to the criteria developed by Cicchetti and Sparrow (1981). Finally, because instructions emphasized quality rather than quantity, we divided the score by the number of items generated to ensure that groups that came up with a lot of low-quality items would not get higher scores than groups that came up with fewer high-quality

[2] In a pretest ($n = 22$), we compared three different distributions of information (only Part A vs. only Part B vs. Parts A and B) using the original surviving in the desert exercise (Johnson & Johnson, 1982) and found a significant effect on performance, $F(2, 19) = 6.73$, $p < .01$, $\eta^2 = .42$ (lower scores reflect better performance). Post hoc tests revealed that students who received all the information (i.e., Parts A and B) did significantly better ($M = 25.00$, $SD = 6.68$) than did those who read only Part A ($M = 35.50$, $SD = 8.60$) or Part B ($M = 39.67$, $SD = 8.24$), with the latter two conditions not significantly differing from each other, $F(1, 12) = 0.83$, *ns*, $\eta^2 = .07$. These findings suggest that (a) Parts A and B were equally useful and informative when it came to listing items needed for survival in the desert, and (b) people who were aware of the information in both parts performed better than did those who knew only Part A or Part B.

items. Thus, performance scores reflect quality of performance, not quantity.[3]

Information elaboration. Group information elaboration involves the degree to which information is shared, processed, and integrated in group interaction (van Knippenberg, De Dreu, & Homan, 2004; cf. Hinsz et al., 1997). Elaboration of information was measured by coding the videotapes of 45 groups (1 group had to be omitted from the analyses because of technical problems). The difference between the heterogeneous and homogeneous information conditions lies in the distribution of 8 of the 12 information items that were divided in Part A (4 items) and Part B (4 items). In the heterogeneous information condition, these subsets were given to the two female and to the two male group members, respectively. Differences in information elaboration between conditions should, therefore, be evident primarily for these 8 pieces of information. Accordingly, our measure of information elaboration focused on these 8 information items.

The coding scheme was constructed as follows. The higher the score, the more an information item was elaborated on. A score of 0 was given when an information item was not mentioned at all during the discussion. A score of 1 was given when information was mentioned, but none of the other members reacted to it (i.e., if the information was only exchanged). A score of 2 was given when one of the members mentioned an item of information and at least one of the other members reacted to it (e.g., by saying something like "OK" or by nodding), but after this the group still failed to ask questions about it or integrate it with the other information. A score of 3 was given when a piece of information was mentioned by one of the group members, and one or more other members clearly responded by asking a question about it (e.g., "Why is it important to give light signals?"). A score of 4 was given when the mentioning of an information item resulted in a conclusion about whether something was important or not (e.g., "Ah, a mirror must be important, you can use the light of the sun to signal with that"). Finally, a score of 5 was given when the information item was combined with another piece of information by one of the other group members (e.g., "Wait a minute, we need protection from the sun as well, right? Why don't we take an aluminum tent with us? That will create shade *and* will reflect light as well"). We used the highest level of information elaboration for each information item (from 0 to 5); the total elaboration was then determined by computing the sum of information elaboration for the eight information categories. It is important to stress that information elaboration was coded in the same way in all conditions (i.e., regardless of whether information items were shared or unshared). Thus, groups in all conditions could obtain scores between 0 and 5 for all eight information items. The maximum number of points that could be obtained thus was eight items $\times$ 5 points for 40 points. Two independent raters, blind to the experimental conditions and hypotheses, coded the videotapes. They provided double ratings of 20% of the videotapes to check interrater reliability. The average ICC for the two raters was .96, which is considered excellent (Cicchetti & Sparrow, 1981).

Results

Treatment of the Data

We used analysis of variance to test Hypotheses 1 and 2 and regression analysis to test Hypothesis 3. Manipulation checks were measured at the individual level, but because the individuals were working in four-person groups, their answers are probably not independent (Kashy & Kenny, 2000). Therefore, we aggregated individuals' answers to the group level. To control whether this aggregation was appropriate, we computed ICC(1), ICC(2), and r_{wg} (e.g., Bliese, 2000). First, to test whether the groups could be reliably differentiated on the manipulation checks, we estimated ICC(2) values. Following Glick's (1985) recommendations, ICC(2) values were acceptable (.79 for the informational diversity check; .68 for the diversity beliefs check). To further support aggregation to the group level, we calculated ICC(1) and r_{wg} values. For both the manipulation check of informational diversity, ICC(1) = .49, $F(45, 138) = 4.81$, $p < .01$, $\eta^2 = .61$, and $r_{wg} = .71$, and manipulation check of diversity beliefs, ICC(1) = .35, $F(45, 138) = 3.14$, $p < .01$, $\eta^2 = .51$, and $r_{wg} = .70$, the obtained values justified aggregation to the group level (George, 1990).

Manipulation Checks

Informational diversity. Groups in the homogeneous information condition ($M = 2.63$, $SD = .67$) indicated that the information that the group members received was less diverse than did groups in the heterogeneous information condition ($M = 4.33$, $SD = .98$), $F(1, 42) = 64.40$, $p < .01$, $\eta^2 = .59$. The manipulation check for informational diversity was not influenced by diversity beliefs, $F(1, 42) = 0.55$, *ns*, $\eta^2 = .01$, nor by the interaction between informational diversity and diversity beliefs, $F(1, 42) = 2.26$, *ns*, $\eta^2 = .05$.

Diversity beliefs. Groups with pro-diversity beliefs ($M = 4.85$, $SD = .84$) indicated that diverse teams would perform and cooperate better than groups with pro-similarity beliefs ($M = 3.64$, $SD = .74$), $F(1, 42) = 25.87$, $p < .01$, $\eta^2 = .38$. The manipulation check for diversity beliefs was not influenced by informational diversity, $F(1, 42) = 0.02$, *ns*, $\eta^2 = .00$, or the interaction between informational diversity and diversity beliefs, $F(1, 42) = 0.40$, *ns*, $\eta^2 = .01$.

Performance

There was no main effect of informational diversity on performance: Groups with diverse information ($M = 6.67$, $SD = 0.98$) showed similar levels of performance as groups with homogeneous information ($M = 6.62$, $SD = 0.97$), $F(1, 42) = 0.28$, *ns*, $\eta^2 = .00$. We did find a significant main effect of diversity beliefs, indicating that groups with pro-diversity beliefs performed better ($M = 6.95$, $SD = 0.96$) than did groups with pro-similarity beliefs ($M = 6.36$, $SD = 0.89$), $F(1, 42) = 5.27$, $p < .05$, $\eta^2 = .11$. Moreover, in support of Hypothesis 1, the interaction between diversity beliefs and informational diversity was significant, $F(1, 42) = 4.25$, $p < .05$, $\eta^2 = .09$. Means and standard deviations pertaining to this interaction are shown in Table 1. Simple effects analysis showed that groups with diverse information and pro-diversity beliefs outperformed groups with diverse information and pro-similarity beliefs, $F(1, 42) = 4.27$, $p < .05$, $\eta^2 = .18$. Groups with homogeneous information were not influenced by

[3] Analysis of variance revealed no effects of the experimental manipulations on the number of items generated, $F(1, 42) = 0.41$, *ns*, $\eta^2 = .02$.

Table 1
Effects of Diversity Beliefs and Informational Diversity on Performance and Information Elaboration

	Informationally heterogeneous				Informationally homogeneous			
	Pro-diversity belief		Pro-similarity belief		Pro-diversity belief		Pro-similarity belief	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Performance	7.20_{a}	0.82	6.04_{b}	0.74	6.70_{ab}	1.07	6.64_{ab}	0.94
Information elaboration	31.55_{a}	5.82	24.70_{b}	5.08	23.64_{b}	3.56	24.54_{b}	4.29

Note. Means within a row with a different subscript differ at $p < .05$. Performance represents the mean number of points obtained per item and ranges from 0 (*poor*) to 12 (*excellent*). Information elaboration ranges from 0 (*no elaboration*) to 40 (*high elaboration*).

diversity beliefs, $F(1, 42) = 0.03$, *ns*, $\eta^2 = .00$. This interaction is depicted in Figure 1.

Information Elaboration

We obtained a significant main effect of informational diversity on information elaboration, showing that groups with diverse information ($M = 28.29$, $SD = 6.39$) elaborated more information than did groups with homogeneous information ($M = 24.13$, $SD = 3.91$), $F(1, 41) = 7.13$, $p < .05$, $\eta^2 = .14$. We also found a significant main effect of diversity beliefs, revealing that groups with pro-diversity beliefs ($M = 27.59$, $SD = 6.21$) elaborated more information than did groups with pro-similarity beliefs ($M = 24.61$, $SD = 4.54$), $F(1, 41) = 4.39$, $p < .05$, $\eta^2 = .08$. More important, these main effects were qualified by a significant Diversity Beliefs × Informational Diversity interaction, $F(1, 41) = 6.61$, $p < .05$, $\eta^2 = .33$ (see Table 1 for means and standard deviations). As predicted in Hypothesis 2, groups with diverse information and pro-diversity beliefs elaborated more information than did groups with diverse information and pro-similarity beliefs, $F(1, 41) = 10.96$, $p < .01$, $\eta^2 = .21$. Groups with homogeneous information were not influenced by diversity beliefs, $F(1, 41) = 0.22$, *ns*, $\eta^2 = .01$. This interaction is shown in Figure 2.[4]

Mediation Analysis

Hypothesis 3 predicted that diversity beliefs would moderate the effect of informational diversity on performance through their impact on information elaboration in informationally diverse groups. To test this proposed pattern of mediation, we followed procedures suggested by Baron and Kenny (1986) and extended by Hull, Tedlie, and Lehn (1992). According to Baron and Kenny (1986), four requirements should be met to establish mediation. First, there should be a significant effect of the independent variable(s) on the dependent variable. Second, there should be an effect of the independent variable(s) on the mediator. Third, the mediator should predict the dependent variable. Finally, the effect of the independent variable(s) should be reduced to nonsignificance when controlling for the mediator.

More recently, Hull et al. (1992; also see Muller, Judd, & Yzerbyt, 2005; Yzerbyt, Muller, & Judd, 2004) proposed an important extension of these procedures. They suggested that in mediation analysis, it also may be relevant to control for the possibility that the proposed mediator is not linearly related to the dependent variable but instead is more strongly related to the dependent variable under certain conditions than under others. When this is the case, entering the mediator as a linear covariate violates the statistical assumption of homogeneity of regression slopes (i.e., the assumption that the slopes of the regression lines are the same in each group). Inclusion of the "covariate interaction" (i.e., the interaction between an independent variable and the

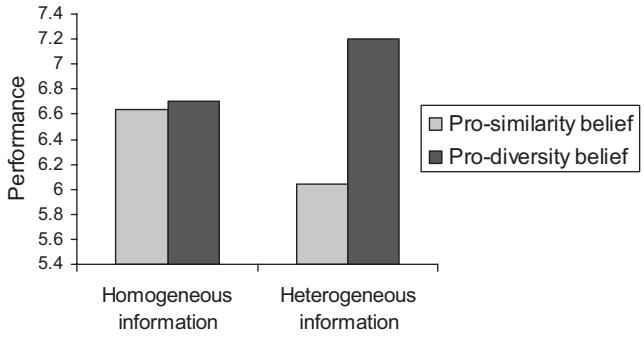

Figure 1. Group performance as a function of informational diversity and diversity beliefs.

[4] Analysis of variance of elaboration of the four items that were shared prior to group interaction in all conditions revealed no main effect of informational diversity, $F(1, 41) = 3.82$, *ns*, $\eta^2 = .09$; no main effect of diversity beliefs, $F(1, 41) = 0.06$, *ns*, $\eta^2 = .001$; and no interaction, $F(1, 41) = 1.10$, *ns*, $\eta^2 = .01$. Consistent with the results for information elaboration based on the subset of information that was unshared in the heterogeneous information conditions, analysis of variance involving the full set of information revealed (a) no effect of the manipulation of diversity beliefs (pro-diversity beliefs: $M = 41.95$, $SD = 9.52$, vs. pro-similarity beliefs: $M = 39.22$, $SD = 6.79$), $F(1, 41) = 1.48$, *ns*, $\eta^2 = .04$; (b) a main effect of the manipulation of informational diversity (informationally heterogeneous: $M = 44.29$, $SD = 8.05$, vs. informationally homogeneous: $M = 37.29$, $SD = 7.08$), $F(1, 41) = 10.34$, $p < .01$, $\eta^2 = .20$; and (c) an interaction between informational diversity and diversity beliefs, $F(1, 41) = 5.04$, $p < .05$, $\eta^2 = .12$. Simple effects analysis showed that groups with diverse information and pro-diversity beliefs ($M = 47.91$, $SD = 6.84$) elaborated more information than did groups with diverse information and pro-similarity beliefs ($M = 40.30$, $SD = 7.63$), $F(1, 41) = 5.89$, $p < .05$, $\eta^2 = .23$. Groups with homogeneous information were not influenced by diversity beliefs (pro-diversity beliefs: $M = 36.00$, $SD = 8.01$, vs. pro-similarity beliefs: $M = 38.39$, $SD = 6.21$), $F(1, 41) = 0.66$, *ns*, $\eta^2 = .03$. Note that in this analysis the mean levels of information elaboration are higher than the means reported in the article because we calculated information elaboration for all 12 items.

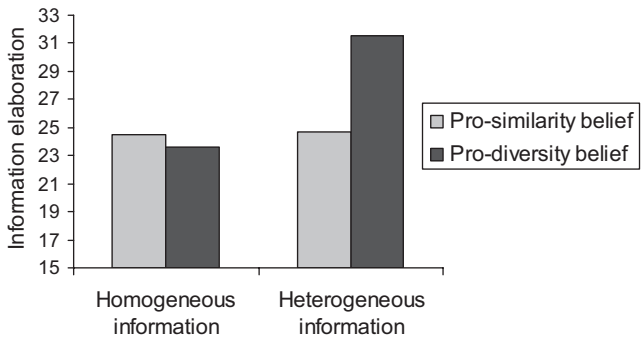

Figure 2. Information elaboration as a function of informational diversity and diversity beliefs.

proposed mediator; Hull et al., 1992) then yields a more appropriate test of mediation (i.e., a test that does not assume homogeneity of regression slopes across conditions; cf. Stevens, 1996) than an analysis that includes only the "main effect" of the proposed mediator (Hull et al., 1992; Muller et al., 2005; Yzerbyt et al., 2004). Our theoretical analysis points to the possibility that information elaboration is more positively related to performance under conditions of informational diversity (i.e., where groups need to exchange and integrate information to reach optimal decisions) than under conditions of informational homogeneity (i.e., where groups in principal can rely more on the pooling of prediscussion preferences, and performance, therefore, may be less contingent on information elaboration). We, therefore, controlled for this possibility by including the covariate interaction between informational diversity and elaboration in our mediational analysis.

In sum, to test our mediation model, we followed the four steps described by Baron and Kenny (1986) but also included the covariate interaction between information elaboration and informational diversity in the analysis, as suggested by Hull et al. (1992). We have already established that informational diversity and diversity beliefs interact to affect performance (Step 1; see analysis under *Performance*), and that pro-diversity beliefs inspired greater elaboration in informationally diverse groups than pro-similarity beliefs (Step 2; see analysis under *Information Elaboration*). Next, we aimed to establish that the proposed mediator, information elaboration, predicted performance (Step 3). To do so, following Hull et al., we regressed performance on information elaboration (centered) as well as on informational diversity (dummy coded) and the interaction between information elaboration and informational diversity. The statistics pertaining to this analysis are summarized in Table 2. This analysis revealed no main effects of information elaboration and informational diversity, but it did reveal a significant interaction. Simple slopes analysis showed that informationally diverse groups performed better when they elaborated more information, $\beta = .47$, $t(41) = 2.60$, $p < .05$, whereas performance of informationally homogeneous groups was not affected by information elaboration, $\beta = -.50$, $t(41) = -1.82$, *ns*. This analysis thus confirms that more information elaboration may be associated with better performance, but that this is only the case in informationally diverse groups. These results point to the need to include the covariate interaction between information elaboration and informational diversity in the final step of the mediation analysis (Hull et al., 1992; Muller et al., 2005; Stevens, 1996; Yzerbyt et al., 2004).

For the final step of the mediation analysis, we regressed performance on diversity beliefs and informational diversity (both dummy coded) and their interaction, as well as on information elaboration and on the interaction between information elaboration and informational diversity. This analysis yielded a significant Information Elaboration × Informational Diversity interaction, and the originally significant interaction between diversity beliefs and informational diversity was reduced to nonsignificance (see Table 2). In line with Hypothesis 3, this pattern of results indicates that the effect of diversity beliefs on performance in informationally diverse groups is mediated by information elaboration.

Discussion

Diverse information and perspectives in work groups can potentially boost group performance, but diverse groups are often unable to benefit from their diversity. Addressing this issue, we proposed that groups are more likely to effectively use their informational resources when group members believe in the value of diversity. We put this proposition to the test under conditions in which groups were characterized by diversity faultlines (Lau & Murnighan, 1998)—a situation widely assumed to stand in the way of groups' effective use of information (see van Knippenberg & Schippers, 2007). In support of our proposition, diversity beliefs moderated the relationship between informational diversity and performance, such that informationally diverse (but not informa-

Table 2
Summary of Hierarchical Regression Results of Mediational Analysis

Predictor	*B*	*SE*	β	*t*	R^2
Performance Step 3					.20*
Informational diversity	−0.06	0.29	−.30	−0.19	
Information elaboration	−0.09	0.05	−.50	−1.82	
Informational Diversity × Information Elaboration	0.17	0.06	.77	2.93*	
Performance Step 4					.27*
Diversity beliefs	−0.46	0.39	−.24	−1.18	
Informational diversity	−0.02	0.37	−.01	−0.05	
Diversity Beliefs × Informational Diversity	0.91	0.65	.39	1.40	
Information elaboration	−0.09	0.05	−.49	−1.83	
Informational Diversity × Information Elaboration	0.13	0.07	.58	2.02*	

Note. The degree of freedom (*df*) for the *t* tests listed for Performance Step 3 is 41; the *df* for the *t* tests listed for Performance Step 4 is 39.
* $p < .05$.

tionally homogeneous) groups performed better when they held pro-diversity beliefs rather than pro-similarity beliefs.

Although a number of scholars have argued that diversity beliefs and related constructs play an important role in teams (e.g., Ely & Thomas, 2001; Kossek & Zonia, 1993; van Knippenberg & Haslam, 2003), a quantitative test of the moderating effect of diversity beliefs on the relation between diversity and group processes and performance was lacking. The present study thus provides an important next step in research on diversity beliefs, attitudes, perspectives, and climates. More generally, the present findings may be viewed as a contribution to attempts to identify the contingencies of the effects of work group diversity. Diversity research has not been overly successful in mapping the effects of work group diversity, and several authors have attributed this to the main effects approach that has characterized a lot of diversity research (Pelled et al., 1999; van Knippenberg, De Dreu, & Homan, 2004; van Knippenberg & Schippers, 2007). The present focus on diversity beliefs as moderator of the effects of work group diversity, thus, also may be seen as testifying to the value of a focus on the contingencies of the effects of diversity.

In addition, we were able to establish that the effect of diversity beliefs in informationally diverse groups was mediated by group elaboration of task-relevant information. Van Knippenberg, De Dreu, and Homan (2004) proposed that information elaboration is the core process underlying the positive effects of diversity on group performance; thus, the present finding that informationally diverse groups were dependent on elaboration to perform well may be interpreted as important first evidence for their theoretical analysis. Moreover, the fact that pro-diversity beliefs engendered elaboration in informationally diverse groups corroborates our proposition that pro-diversity beliefs invite group members to actively capitalize on their group's diversity.

Clearly, the difference between the heterogeneous information and homogeneous information condition lies in the subset of information that was unshared prior to group interaction in the heterogeneous information condition but given to all group members in the homogeneous information condition. Differences in information elaboration between conditions should, therefore, materialize primarily for this subset of information, and, accordingly, our measure of elaboration focused on this subset of information. Arguably, however, we should test whether differences in information elaboration are limited to this subset rather than assume this to be the case. We, therefore, also analyzed elaboration of the four pieces of information that were given to all group members in all conditions and elaboration of the total set of information. Corroborating our analysis, results (reported in Footnote 4) showed that elaboration of the subset of information that was given to all group members in both conditions was unaffected by the experimental manipulations, whereas findings for elaboration of the total set of information yielded similar conclusions as the analysis that concentrated on the information items that were not shared in the heterogeneous condition.

It is important to emphasize that we should not conclude too much from the main effect of informational diversity on information elaboration (i.e., overall, groups with heterogeneous information elaborated more). First, by the very nature of the task, there is a greater need to engage in information elaboration in informationally heterogeneous groups than in informationally homogeneous groups. Individual members of informationally diverse teams do not possess all the relevant information prior to group interaction; therefore, they need to exchange information with the other group members and elaborate on this information to get a thorough understanding of the task. Members of informationally homogeneous groups, in contrast, have a lesser need to exchange information because all the members of the group possess all the relevant information before group interaction. This is an inherent difference between informationally homogeneous and informationally heterogeneous groups. Second, the pattern of means for the interaction shows that the main effect of informational diversity on information elaboration is fully qualified by the interaction with diversity beliefs: It can be attributed solely to groups with heterogeneous information and pro-diversity beliefs. Finally, the finding that performance is more contingent on diversity beliefs in the heterogeneous information conditions than in the homogeneous information conditions indicates that it is the interaction between informational diversity and diversity beliefs, rather than the main effect of informational diversity, that predicts performance.

Because faultlines were a constant in our study, we should be careful not to conclude that the present findings pertain to the effects of faultlines. Rather, our results concern group processes and performance under faultline conditions. Given what we know about the effects of faultlines (e.g., Lau & Murnighan, 2005; Li & Hambrick, 2005), the current focus on performance under faultline conditions provides a test of the effects of diversity beliefs in conditions under which diversity often has been found to disrupt group processes. If pro-diversity beliefs can stimulate groups to use their informational diversity under faultline conditions, we might expect that pro-diversity beliefs also are able to boost diverse groups' performance under conditions that are less conducive to the disruptive effects of work group diversity.

In a related vein, the fact that diversity beliefs affected group performance under faultline conditions corroborates another point raised by van Knippenberg, De Dreu, and Homan (2004). They argued that salient subgroup categorizations in diverse groups as such are not problematic. The problem is intergroup bias that may, but need not, be engendered by subgroup categorization. Faultlines are generally assumed to render subgroup categorization salient, and the present findings, thus, might be interpreted as showing that salient subgroups need not be detrimental to group performance, and that diversity beliefs moderate the extent to which salient subgroups elicit detrimental group processes.

Although experiments are not conducted in a quest for external validity (Dipboye, 1990; Mook, 1983), reports of experimental research tend to elicit questions of external validity among their readership. Obviously, then, confidence in the conclusions advanced here could be bolstered when the current results are replicated in a study of teams in actual organizations, and this would indeed seem an important avenue for future research. In this respect, it is noteworthy that a previous study of work group diversity found similar effects of diversity beliefs on identification in both a laboratory experiment and a field study (van Knippenberg, Haslam, & Platow, 2004). Likewise, Ely and Thomas' (2001) qualitative analysis of the role of diversity perspectives in organizations suggests that the effects of diversity beliefs observed in the present study also occur in the field. As always, however, the proof of the pudding is in the eating, and it would be valuable if future

research would focus on the effects of diversity beliefs on team performance in the field.

An interesting possibility in this respect is that the influence of diversity beliefs on diverse teams' performance might actually be greater in the field. In organizations, informationally diverse teams typically have a larger pool of information and perspectives than informationally homogeneous teams. Accordingly, when circumstances are conducive to the elaboration of task-relevant information, informationally diverse teams should be able to outperform informationally homogeneous teams (e.g., Jehn et al., 1999). This means that pro-diversity beliefs might lead informationally diverse teams to outperform informationally homogeneous teams because the former are likely to have more information at their disposal than the latter. This possibility could not be addressed in the present study because providing informationally diverse groups with more information than informationally homogeneous groups would have confounded informational diversity with the amount of information available to the group. Although this confounding is likely to occur in organizations, it was undesirable for our purposes because the aim of the present study was to show that diversity beliefs (and not the amount of information available) moderate the diversity–performance relationship. We expect that, in organizations, informationally diverse groups may outperform informationally homogeneous groups partly because they will often have more information, and we expect this to happen especially when they hold pro-diversity beliefs.

From an applied perspective, an important implication of the present findings is that the effective management of a diverse workforce should involve the management of diversity beliefs. For example, managers may foster pro-diversity beliefs by communicating their belief in the value of diversity and by explaining how task performance can benefit from diversity of information and perspectives. We should realize, however, that the present findings were obtained in ad hoc groups of students with presumably no strong beliefs about the implications of gender diversity for performance in decision-making tasks. Even though earlier studies on diversity beliefs and cultures in organizations have suggested that diversity beliefs are malleable (Ely & Thomas, 2001; van Knippenberg, Haslam, & Platow, 2004), we should expect constraints with regard to the extent and the ease with which organizational members can be convinced of the value of particular dimensions of diversity. For instance, diversity is more valuable for more complex, knowledge-intensive tasks than for more simple, routine tasks (van Knippenberg & Schippers, 2007). Arguably, then, it should be more feasible for managers to explain the value of diversity in more complex tasks than in more routine tasks. Stereotypic beliefs may also stand in the way of pro-diversity beliefs (i.e., it might be hard to convince a person with racist beliefs of the value of ethnic diversity). Accordingly, although the present study suggests that fostering pro-diversity beliefs may be an important aspect of the successful management of diversity, more work clearly needs to be done to develop our understanding of the possibilities to foster pro-diversity beliefs in organizations.

In a related way, current results also have implications for diversity training programs. Diversity training could, in principle, exert an important influence on diversity beliefs. However, most diversity training programs seem to be limited to making people aware of their stereotypes about other groups and changing people's feelings and ideas about those groups (e.g., Karp & Sammour, 2000; Kossek & Lobel, 1996; Rynes & Rosen, 1995). The current findings suggest that it is also important to manage people's feelings about diversity itself (rather than about different others) and to make them aware of the potential value of being a member of a diverse team. It would, therefore, seem worthwhile to extend diversity training programs beyond this focus on stereotypes to include a focus on beliefs about and attitudes toward diversity itself (cf. van Knippenberg, Haslam, & Platow, 2004).

Given the potential benefits of a workforce endorsing pro-diversity beliefs, an important direction for future research would seem to be to develop theory about the origins of diversity beliefs. At least three partly related antecedents of diversity beliefs are suggested by previous research. First, van Knippenberg, Haslam, and Platow (2004) identified task requirements as a source of diversity beliefs, showing that individuals working on a task that required diverse perspectives developed more positive attitudes toward diversity than did individuals who worked on a task that required homogeneous perspectives (cf. the notion that diversity is more beneficial on more knowledge-intensive tasks; e.g., van Knippenberg, Haslam, & Platow, 2004). Second, prior experience would seem to be a source of diversity beliefs. When people have positive experiences with working in a diverse group, it is likely that those experiences will shape their beliefs about diversity in the future. Finally, Flynn (2005) and Strauss et al. (2003) noted that individual difference variables may affect beliefs about different ethnic groups and diversity in general. One variable that might be of interest in this context is openness to experience (e.g., Flynn, 2005). In sum, then, it would seem appropriate to explore individual differences as well as situational influences both internal and external to the work group as determinants of diversity beliefs. Considering these and other potential precursors of diversity beliefs may help to lay the foundations for successful diversity management in organizations.

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New Editors Appointed, 2009–2014

The Publications and Communications Board of the American Psychological Association announces the appointment of six new editors for 6-year terms beginning in 2009. As of January 1, 2008, manuscripts should be directed as follows:

- *Journal of Applied Psychology* (http://www.apa.org/journals/apl), **Steve W. J. Kozlowski, PhD,** Department of Psychology, Michigan State University, East Lansing, MI 48824.
- *Journal of Educational Psychology* (http://www.apa.org/journals/edu), **Arthur C. Graesser, PhD,** Department of Psychology, University of Memphis, 202 Psychology Building, Memphis, TN 38152.
- *Journal of Personality and Social Psychology: Interpersonal Relations and Group Processes* (http://www.apa.org/journals/psp), **Jeffry A. Simpson, PhD,** Department of Psychology, University of Minnesota, 75 East River Road, N394 Elliott Hall, Minneapolis, MN 55455.
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- *Psychological Bulletin* (http://www.apa.org/journals/bul), **Stephen P. Hinshaw, PhD,** Department of Psychology, University of California, Tolman Hall #1650, Berkeley, CA 94720. (Manuscripts will not be directed to Dr. Hinshaw until July 1, 2008, as Harris Cooper will continue as editor until June 30, 2008.)

Electronic manuscript submission: As of January 1, 2008, manuscripts should be submitted electronically via the journal's Manuscript Submission Portal (see the website listed above with each journal title).

Manuscript submission patterns make the precise date of completion of the 2008 volumes uncertain. Current editors, Sheldon Zedeck, PhD, Karen R. Harris, EdD, John F. Dovidio, PhD, Howard J. Shaffer, PhD, and John F. Disterhoft, PhD, will receive and consider manuscripts through December 31, 2007. Harris Cooper, PhD, will continue to receive manuscripts until June 30, 2008. Should 2008 volumes be completed before that date, manuscripts will be redirected to the new editors for consideration in 2009 volumes.