Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups

Karen A. Jehn
University of Pennsylvania
Gregory B. Northcraft
University of Illinois, Champaign
Margaret A. Neale
Stanford University

A multimethod field study of 92 workgroups explored the influence of three types of workgroup diversity (social category diversity, value diversity, and informational diversity) and two moderators (task type and task interdependence) on workgroup outcomes. Informational diversity positively influenced group performance, mediated by task conflict. Value and social category diversity, task complexity, and task interdependence all moderated this effect. Social category diversity positively influenced group member morale. Value diversity decreased satisfaction, intent to remain, and commitment to the group; relationship conflict mediated the effects of value diversity. We discuss the implications of these results for group leaders, managers, and organizations wishing to create and manage a diverse workforce successfully.

In response to changing economic conditions, organizations recently have embraced new structural forms designed to reduce costs while simultaneously maximizing flexibility and responsiveness to customer demands (e.g., Boyett and Conn, 1991; Byrne, 1993; Donnellon, 1996). The resulting flatter, more decentralized organizational forms tend to be built around groups and depend on rich synchronous communication provided by teams and task forces to a much greater extent than more traditional hierarchical and centralized organizations (Nohria, 1991). In addition, groups have become important vehicles for identifying high-quality solutions to emerging organizational problems (Dumaine, 1991).

While groups have become central to organizations, they present their own intrinsic problems of coordination, motivation, and conflict management (Gladstein, 1984; Jehn, 1995). In large part, the use of groups as fundamental building blocks of organizational structure and strategy seems to be premised on the assumption that groups can gather together the diversity of information, backgrounds, and values necessary to make things happen (Jackson, 1992), to produce effective organizational action. If groups are to provide forums for sharing information across functional and cultural boundaries (Lipnack and Stamps, 1993), however, the diverse views and backgrounds members bring with them to the group must be successfully managed. Moreover, the workforce is becoming increasingly diverse on a number of dimensions (e.g., age, gender, ethnicity). Although differences among members of workgroups are the norm, Byrne's (1971) similarity-attraction theory suggests that people prefer similarity in their interactions. Likewise, theories of selection (Chatman, 1991) and socialization (Van Maanen and Schein, 1979) promote similarity in values and demographics as the basis for maintaining effective work environments. Recently, however, diversity theorists (Jackson, 1992; Williams and O'Reilly, 1998), group researchers (Lipnack and Stamps, 1993; Gruenfeld, 1995; Gruenfeld et al., 1996), and creativity theorists (Amabile, 1994; Oldham and Cummings, 1998) have been singing the praises of diversity in workgroups. But empirical research on the effects of diversity has produced mixed results.

In some studies, diverse groups have been shown to outperform homogenous groups (Hoffman and Maier, 1961; Hoff-

0001-8392/99/4404-0741/$1.00

We appreciate the research support provided by the Reginald H. Jones Center for Management Policy, Strategy, and Organization. We would also like to thank Sandeep Murthy, Emma Vas and Sara Yang for their assistance with data entry and analysis and the Wharton Meso Working Paper Series (especially Sherry Thatcher, Anne Cummings, Keith Weigelt, and Steffanie Wilk), Associate Editors Dan Brass and Keith Murnighan, and three anonymous *ASQ* reviewers for their helpful comments on earlier drafts.

man, 1978; Nemeth, 1986; Jackson, 1992). In contrast, other studies have demonstrated that homogenous groups avoid the process loss associated with poor communication patterns and excessive conflict that often plague diverse groups (Steiner, 1972; O'Reilly and Flatt, 1989; Ancona and Caldwell, 1992). These inconsistent results should not be all that surprising. No theory suggests that a workgroup's diversity on outward personal characteristics such as race and gender should have benefits except to the extent that diversity creates other diversity in the workgroup, such as diversity of information or perspective. For instance, social category diversity may not always reflect other types of diversity (Tsui and O'Reilly, 1989)—age does not necessarily reflect values or even work experience. Even when workgroups do possess that "other" diversity (e.g., information or perspective), performance benefits should be expected only to the extent that workgroup members successfully manage the difficulties of interacting effectively with dissimilar others (e.g., Tsui and O'Reilly, 1989).

In light of these concerns, it is also not surprising that Williams and O'Reilly's (1998) review of forty years of diversity research concluded that there are no consistent main effects of diversity on organizational performance. They proposed that a more complex framework and a more complex conceptualization of the nature of diversity are needed to study the impact of diversity. Specifically, they called for the incorporation of contextual aspects (e.g., task and organizational characteristics), types of diversity (informational and demographic), and intervening variables (e.g., communication and conflict). Our study addresses these concerns by examining the effects of three specific types of diversity (informational diversity, social category diversity, and value diversity), a key intervening process (conflict), and two contextual moderators of these effects (task interdependence and task type) on workgroup outcomes. We thus provide a more detailed model of the process by which various types of workgroup diversity affect performance than past theorizing. For example, differences in gender may not affect member satisfaction if all members express similar values, and information diversity may have little effect on performance when tasks are highly routine.

Our research builds on prior research investigating various aspects of contextual and intervening variables to articulate a more comprehensive understanding of the relationship between diversity and performance. Pelled (1996a, 1996b), for example, suggested that a workgroup's social category diversity (group differences in social category membership) enhances its performance and that task conflict—disagreement about task issues—mediates the effects of social category diversity. In contrast to task conflict, however, relationship conflicts, which are often caused by social category diversity, can negatively influence group outcomes (Jehn, 1995). Thus, while personality conflicts may interfere with task performance, conflict about the best way to perform the task may lead to insights that increase task performance. We investigate three types of conflict to determine how different types of diversity influence workgroup outcomes.

EFFECTS OF DIVERSITY IN WORKGROUPS

Diversity and Conflict

Researchers have devoted considerable attention to how workgroups can generate knowledge and insights beyond the reach of their individual members (e.g., Murray, 1983; Doise and Mugny, 1984; Perret-Clermont, Perret, and Bell, 1991; Garton, 1992). This research on emergent knowledge in groups suggests that social interaction among diverse perspectives can lead to the emergence of new insights through conceptual restructuring within the groups (e.g., Levine and Resnick, 1993). The creation of knowledge and the discovery of insight by groups appears to depend on the presence of diverse viewpoints and perspectives about the task (Damon, 1991; Levine and Resnick, 1993; Nonaka and Takeuchi, 1995). We explore three categories of diversity discussed in past research on groups: informational diversity, social category diversity, and value diversity. These three types of diversity are not always distinct in practice. For example, two individuals from different races (social category diversity) may (though not necessarily) have experienced different educational cultures (informational diversity) and may consequently espouse different values (value diversity). Each of these different kinds of diversity implies different challenges and opportunities for workgroups, and consequently, each should differentially influence workgroup outcomes.

Informational diversity. Informational diversity refers to differences in knowledge bases and perspectives that members bring to the group. Such differences are likely to arise as a function of differences among group members in education, experience, and expertise. These differences in educational background, training, and work experience increase the likelihood that diverse perspectives and opinions exist in a workgroup (Stasser, 1992). Recent research has demonstrated that differences in educational background lead to an increase in task-related debates in work teams (Jehn, Chadwick, and Thatcher, 1997). Task-related debates can be about either the content or the process of the task. Task content is about what to do (e.g., a new marketing campaign), in contrast to task process, which is about how to do it (e.g., delegation of responsibilities). Following Jehn (1995, 1997), we refer to disagreements about task content as task conflict and disagreements about task process as process conflict. We expect that informational diversity will increase the potential for task conflict:

Hypothesis 1a (H1a): Informational diversity will increase task conflict in workgroups.

Workgroups often fail to realize the potential benefits of informational diversity and task conflict for two reasons. First, when groups form naturally in organizations, the most common bases for group formation are similarity (e.g., Newcomb, 1960; Ancona and Caldwell, 1992), proximity (e.g., Festinger, Schachter, and Back, 1950), and familiarity (e.g., Tenbrunsel et al., 1994; Mannix, Goins, and Carroll, 1996). These natural group formation processes typically overselect members from the same social networks. Because the knowledge, experiences, and perspectives of group members from the same social networks may be more redundant

than diversified (Granovetter, 1973), naturally formed groups are likely to lack diversity, undermining their potential for learning, insight, and problem-solving effectiveness (Jackson, 1992).

Organizations often counter the tendency of groups to form based on shared social networks (i.e., similarity, proximity, familiarity) by creating cross-functional teams, or teams with members of different functional training, to enhance the informational diversity available in the group (Northcraft et al., 1995). Even when group membership is specifically managed to enhance informational diversity, however, the potential of this diversity often is not realized (Steiner, 1972; Hackman, 1990). Dougherty (1992), for example, found that cross-functional new product teams had difficulty getting their products to market, and Ancona and Caldwell (1992) found managers' ratings of innovativeness to be lower when teams were functionally diverse than when they were homogeneous. Similarly, O'Reilly and Flatt (1989) found that top management teams with homogeneous patterns of organizational tenure were more creative than teams whose tenure patterns were more diverse.

Groups with diverse members often prove ineffective at capitalizing on the potential benefits of their informational diversity (Stasser and Titus, 1985, 1987). Managers have expressed frustration with the time and resource demands of functionally diverse teams, while team members have bemoaned the difficulty of motivating their members to work together effectively (Dumaine, 1994). Even in groups demonstrating performance benefits from membership diversity, group members report finding the experience frustrating and dissatisfying (e.g,. Baron, 1990; Amason and Schweiger, 1994).

The second reason groups often fail to realize the benefit of informational diversity is that what makes a group informationally diverse may also prevent the group from realizing the benefits of its informational diversity. Disagreements in workgroups could be disagreements about task content (task conflict), but they could also be disagreements about how to do the task or how to delegate resources, reflecting process conflict (Jehn, 1997). For example, a group member with an engineering background will probably want to proceed differently (in terms of how to identify potential courses of action and choose among them) than a group member with a marketing or accounting background. Therefore, process conflict—disagreements about delegation of duties and resources—are often distinct from task content conflicts—potentially productive disagreements about the task or problem at hand, such as the interpretation of market analysis. Recent research has demonstrated that groups with members of diverse educational majors experience more difficulty defining how to proceed than groups in which members have similar educational backgrounds (Jehn, Chadwick, and Thatcher, 1997). This gives rise to a second hypothesis:

Hypothesis 1b (H1b): Informational diversity will increase process conflict in workgroups.

Social category diversity. While informational diversity is clearly an important resource for organizations, social cat-

egory diversity is most often what people are referring to when talking about diversity (McGrath, Berdahl, and Arrow, 1996). Social category diversity refers to explicit differences among group members in social category membership, such as race, gender, and ethnicity (Jackson, 1992; Pelled, 1996a). Explicit social category membership characteristics provide a particularly salient basis by which individuals can categorize themselves and others. Social category diversity is likely to influence group interactions by virtue of social identity effects (e.g., Tajfel and Turner, 1986).

According to social identity theory, group members establish positive social identity and confirm affiliation by showing favoritism to members of their own social category (e.g., Billig and Tajfel, 1973), an effect, via discrimination and self-segregation, that disrupts group interaction. Social category membership provides naturally occurring lines along which conflicts can be drawn; categorizing individuals into different groups can provoke hostility or animosity within the workgroup. This intragroup hostility can surface as relationship conflict—conflict over workgroup members' personal preferences or disagreements about interpersonal interactions, typically about nonwork issues such as gossip, social events, or religious preferences (Jehn, 1995, 1997). This leads to another hypothesis:

Hypothesis 2 (H2): Social category diversity will increase relationship conflict in workgroups.

Value diversity. Value diversity occurs when members of a workgroup differ in terms of what they think the group's real task, goal, target, or mission should be. In many cases, these differences can lead to task conflict—disagreements about task content such as disagreements about appropriate advertisements (Jehn, 1994). They also could lead to process conflicts—disagreements about delegation and resource allocation. For instance, group members who value effectiveness (e.g., quality) are likely to have disagreements about duty and resource allocation with group members who value efficiency (e.g., units produced). In addition, similarity in group members' goals and values enhances interpersonal relations within the group (Hackman, 1990). This similarity of values will likely decrease relationship conflict among members (Jehn, 1994). This leads to a third hypothesis:

Hypothesis 3 (H3): Value diversity will increase task conflict, process conflict, and relationship conflict in workgroups.

Diversity and Performance

Research addressing the determinants of group performance in organizations suggests that success often hinges on the ability of the workgroup to embrace, experience, and manage (rather than avoid) disagreements that arise (Tjosvold, 1991; Gruenfeld et al., 1996). Considerable evidence points to the detrimental effects of unmanaged conflicts (e.g., Pruitt and Rubin, 1986; Bettenhausen, 1991; Jehn, 1997). Schwenk and Valacich (1994) found that evaluating and critiquing—engaging conflicts about the task—yielded better decisions in workgroups than when members avoided conflicts or smoothed over their disagreements. Similarly, Putnam (1994) showed that explicit task disagreements helped group members better identify issues, and Baron (1991)

showed that disagreements within groups encouraged group members to develop new ideas and approaches.

Mischel and Northcraft (1997) noted that a workgroup's success depends not only on its ability to do the task but also on the group's ability to manage its own interactions effectively, including communicating, cooperating, and coordinating its collective efforts. Similarly, Nonaka and Takeuchi (1995), in their discussion of the organizational conditions that facilitate group performance in knowledge-creating companies, suggested that informational diversity can offer little benefit to a workgroup whose members cannot work together effectively to capitalize on it. They suggested that total diversity among workgroup members is not desirable; rather, some similarity in perspective among group members is necessary to ensure enough common ground to facilitate successful group interaction. Given the aforementioned negative effects of value and social category diversity (i.e., increased relationship conflict), similarity is likely to be most effective in the areas of value and social category diversity. In effect, low value diversity and low social category diversity create conditions for a workgroup to take advantage of its informational diversity, which should be reflected in workgroup performance:

Hypothesis 4 (H4): The effects of informational diversity on workgroup performance will be moderated by value diversity and social category diversity within the group; informational diversity is more likely to increase workgroup performance when value diversity and social category diversity in the group are low than when they are high.

Performance is not the only outcome of interest to organizational workgroups. Also at stake are the morale and commitment of the workers, which have long-term implications for group performance as well as for costs associated with absenteeism and turnover. Individuals do not enjoy being immersed in interpersonal conflict (Walton and Dutton, 1969; Peterson, 1983; Ross, 1989), and such conflict makes individuals less likely to remain (Pervin and Rubin, 1967; Emmons, Diener, and Larsen, 1986; Chatman, 1991). Significantly, it is not necessarily differences resulting from informational diversity in how to solve the problem or make the decision that creates the ill-will and bad feelings leading to physical or psychological withdrawal; rather, it typically comes from the relationship conflict often caused by social category diversity and value diversity:

Hypothesis 5 (H5): High value diversity and social category diversity will decrease worker morale.

Moderators of Diversity Effects

The effects of workgroup diversity on workgroup performance are likely to be affected by structural aspects of the task (e.g., Brehmer, 1976; Van de Ven and Ferry, 1980). Evidence suggests that when a task is simple and well understood, group members can rely on standard operating procedures. Under these circumstances, debates about task strategy are unnecessary and likely to prove disruptive and counterproductive (Barnard, 1938; Gladstein, 1984; Jehn, 1995). This is consistent with Jehn's (1997) finding that process conflict interferes with effective performance of simple,

routine tasks. When a task is complex and not well understood, however, discussing and debating competing perspectives and approaches is essential for group members to identify appropriate task strategies and to increase the accuracy of members' assessments of the situation (e.g., Fiol, 1994; Amason and Schweiger, 1994; Putnam, 1994; Jehn, 1995). Such complex tasks require problem solving, have a high degree of uncertainty, and have few set procedures (Van de Ven, Delbecq, and Koenig, 1976), while routine tasks have a low level of variability, are repetitive (Hall, 1972), and are generally familiar and done the same way each time (Thompson, 1967). The constructive discussions and debates needed to accomplish complex tasks depend on the availability of informational diversity:

Hypothesis 6 (H6): Informational diversity is more likely to increase workgroup performance when tasks are complex rather than routine.

Prior research also suggests that task interdependence can influence diversity effects in workgroups. Task interdependence is the extent to which group members rely on one another to complete their jobs (Van de Ven, Delbecq, and Koenig, 1976). When tasks are interdependent, the demand for smooth interaction among group members (communication, cooperation, and coordination of effort) is heightened (Thibaut and Kelley, 1959; Salancik and Pfeffer, 1977; Saavedra et al., 1993). The disruptive effect of value diversity and social category diversity will be exacerbated when tasks are interdependent:

Hypothesis 7 (H7): The moderating effects of value diversity and social category diversity on the relationship between informational diversity and workgroup performance will be stronger when tasks are interdependent rather than independent.

The inhibiting effect of value and social diversity on the positive relationship between informational diversity and performance (H4) will be increased when members must interact closely to perform a task. Similarly, because task interdependence heightens the disruptive roles of value diversity and social category diversity on group interaction, task interdependence also should strengthen the negative effects of value diversity and social category diversity on worker morale:

Hypothesis 8 (H8): Value diversity and social category diversity will be more likely to decrease morale when tasks are interdependent than when they are independent.

Mediators of Diversity Effects

Finally, because we have hypothesized that informational, value, and social category diversity give rise to conflict in workgroups and that conflict in turn has been linked to workgroup performance (e.g., Jehn, 1995), we also hypothesize that the effects of workgroup diversity will be mediated by the types of conflict in the workgroup they give rise to, based on the previous discussions. Relationship and process conflict have been negatively linked to performance and morale, while task conflict has been shown to have positive effects on performance (Jehn, 1995, 1997; Amason, 1996). Therefore, we propose the following hypotheses:

Hypothesis 9a (H9a): Task conflict will mediate the effects of informational diversity on workgroup performance.

Hypothesis 9b (H9b): Process conflict will mediate the effects of informational diversity on workgroup performance.

Hypothesis 9c (H9c): Process conflict will mediate the effects of value diversity on worker morale.

Hypothesis 9d (H9d): Relationship conflict will mediate the effects of value diversity and social category diversity on worker morale.

The hypotheses were tested in a field study of organizational groups.

METHODS

Research Site and Sample

The sample consisted of 545 employees in one of the top three firms in the household goods moving industry. The sample (as reported in Jehn, 1995) was taken from the international headquarters for this firm, which houses all functional areas: divisions include marketing and sales, accounting, information systems, domestic and international operations, etc. The featured diversity constructs and measures are unique to this study.

This firm had formally designated work units (teams). A work unit is defined in the organization as a group in which all personnel report directly to the same supervisor and interact to complete unit tasks. We verified the organization's delineation of work units by examining departmental reports and organizational charts, which indicated that members were batched together to perform tasks and were seen by others as a group. The organization's delineation of work units was quite accurate and corresponded with the supervisors' and employees' view of who their fellow group members were.

Work units completed all functions within the organization, from sorting and delivering mail to making corporate strategy. The work units included sales units selling services to corporations moving their employees to other domestic and international locations, data entry and coding units that process this information, and groups that oversee the governmental regulations on state and national cross-border transit. This organization provides a fitting arena in which to test our hypotheses, since it has well-delineated work units that vary on a wide range of demographic variables and our other variables of interest (e.g., conflict, task type, interdependence) yet were relatively similar in size ($x = 6.21$, s.d. = .47).

Survey Procedure

We distributed a survey to all employees in the firm. Although the survey was voluntary, the chief executive officer requested that all employees participate in the confidential study, supervisors and employees were told in advance that we would be there to administer the survey, and employees were given company time to complete it. The response rate of the survey (89 percent, 485 employees) was quite high and included 92 complete work units. Later, we followed up with employees who were absent or off-site (e.g., sales teams) when we administered the survey. The high response rate allowed us to include in the analysis only units

with a 100-percent response rate. Thirteen units that did not achieve full response were dropped from the study.

The survey consisted of 85 self-report, Likert-style questions, randomly ordered. We used personnel records to verify the demographic information collected by the survey and, at the same time, collected archival data, such as performance appraisals and departmental output reports. Sixty supervisors, managers, and vice presidents received and returned a packet of materials to evaluate their work unit(s). Information collected in this packet included organizational charts, group and individual effectiveness ratings, and departmental output reports.

Measures

Diversity. Perceived *value diversity* among group members was measured by six 5-point Likert scales anchored by 1 = "Strongly disagree" and 5 = "Strongly agree." Members were asked if the values of all group members were similar, if the work unit as a whole had similar work values, if the work unit as a whole had similar goals, whether members had strongly held beliefs about what was important within the work unit, whether members had similar goals, and if all members agreed on what was important to the group. The coefficient alpha for this scale was .85. Items were reverse-coded so that higher scores reflected higher diversity.

Following past research (e.g., McGrath, Berdahl, and Arrow, 1996; Jehn, Chadwick, and Thatcher, 1997), *informational diversity* measures assessed heterogeneity of education (i.e., major), functional area in the firm (e.g., marketing, mailroom, operations), and position in the firm (i.e., hourly employee or management). *Social category diversity* measures assessed heterogeneity of sex and age. The firm's executives declined to provide data on the ethnic background or nationality of the employees.

As is typical in the treatment of categorical variables, we used the entropy-based index (Teachman, 1980; Ancona and Caldwell, 1992) to form an aggregate measure of the informational and social category diversity within workgroups:

$$\text{Diversity} = \sum - P_i(\ln P_i),$$

where P_i represents the proportion of the work unit that has each diversity characteristic. If a demographic characteristic is not represented in the team, the value assigned is zero. Thus, the diversity index represents the sum of the products of each characteristic's proportion in the work unit's makeup and the natural log of its proportion. The higher the diversity index, the greater the distribution of characteristics within the work unit. If the work unit is composed of six individuals, one female and five male, their diversity index is .4506; if all six members are female, the diversity index is 0.00; and if three members are female and three are male, the diversity index is .6931. Likewise, a group with three engineers and three accountants would have a diversity index of .6931, and if all members are engineers, the diversity index is 0.00.

Intragroup conflict. We used the items of the intragroup conflict scale developed by Jehn (1995) to measure the amount and type of perceived relationship and task conflict

in the work units. The 12 items on the presence of conflict were rated on a 5-point Likert scale anchored by 1 = "None" and 5 = "A lot." Four items measured *relationship conflict* ("How much friction is there among members in your work unit?" "How much are personality conflicts evident in your work unit?" "How much tension is there among members of your work unit?" and "How much emotional conflict is there among members in your work unit?"). Examples of the five items measuring *task conflict* include the following: "How frequently are there conflicts about ideas in your work unit?" and "How often do people in your work unit disagree about opinions?" The coefficient alphas for relationship and task conflict were .90 and .88, respectively.

Three items measuring *process conflict* were taken from Shah and Jehn (1993): "How often do members of your work unit disagree about who should do what?" "How frequently do members of your work unit disagree about the way to complete a group task?" and "How much conflict is there about delegation of tasks within your work unit?" The coefficient alpha for process conflict was .78.

High correlations among the conflict variables led us to conduct a number of analyses to examine the discriminant validities of the conflict variables, using Howell's (1987) approach. While it is important to discriminate between these measures in our analyses, it is not unreasonable to expect that the different types of conflict may overlap. For example, conflicts originating in personal relationships have been shown to spill over into disagreements about how to do the task (Jehn, 1997). The test of discriminant validity computes the upper limit for the confidence interval of the observed correlations and assesses whether this limit is smaller than the maximum possible correlation between the scores as computed from their reliability coefficients. All of the conflict construct pairs meet the discriminant validity test at $p <$ .0013. In addition, in conducting a factor analysis with oblique rotation, we found results similar to Shah and Jehn (1993), Amason (1996), and others (Amason and Sapienza, 1997; Janssen, Van De Vliert, and Veenstra, 1998) who used the intragroup conflict scale (Jehn, 1995) and found that relationship, task, and process conflict items load separately (see Simons and Peterson, 1999, for a review of these studies and the intercorrelations between the types of conflict).

Task moderator variables. To measure *task interdependence,* we used Van de Ven, Delbecq, and Koenig's (1976) workflow interdependence scale, which provides diagrams depicting the workflow within a unit to measure interdependence. Group members indicated on a 5-point Likert scale the degree to which the level of interdependence in their work unit was similar to the diagram. The average standard deviation among members within units was quite low (s.d. = .34), indicating that members viewed their level of task interdependence similarly. We also included Likert-style questions on task interdependence: "Within my work unit, people have one-person jobs: that is, people can complete most of the jobs on their own, with no help from others" (reverse coded); "Often, all the work unit members meet together to discuss how each task, case, or claim should be performed or treated in order to do the work in this unit." The Cron-

bach alpha of these items (including the diagram Likerts) was .78. In addition, we verified the reported interdependence with respondents' supervisors and via observation.

Task type was measured using an adaptation and combination of Perrow's (1970) index of routinization and Van de Ven, Delbecq, and Koenig's (1976) dimension of task variety. Examples of items from the 12-item, agree-disagree 5-point scale are "I encounter a lot of variety in my normal working day" (reverse coded), "The methods I follow in my work are about the same for dealing with all types of work, regardless of the activity," "My job is very routine," and "I feel like I am doing the same thing over and over again," and are similar to Jehn's (1995) routineness adaptation of the same scales. The coefficient alpha for this scale was .94, with high scores reflecting routineness. We verified the scores for the reported team task type scores with supervisors' reports and observation of the task units at work.

Worker morale. We used three different measures of *worker morale:* satisfaction, intent to remain, and commitment. Individual satisfaction with the group was measured by a 5-point Likert question ("How satisfied are you working in this work unit?") anchored by 1 = "Not at all" and 5 = "Very" and the Kunin Faces Scale (1955). Members responded to the Kunin Faces Scale by circling the face that indicated how happy they were working in their groups. The coefficient alpha for the two satisfaction items was .85. Members also reported on their intent to remain in the group by responding to Kraut's (1975) measure of tenure intentions: "How long do you expect to stay in this work unit?" "If you have your own way, will you be working in this same work unit three years from now?" and "Do you want to change work units?" The Cronbach alpha of the three-item scale was .96.

We rated the commitment of group members by the degree to which members agreed or disagreed on a 5-point Likert scale with the following items: "I talk up this work unit to my friends as a great group to work in," "I am very committed to my work unit," "I am proud to tell others that I am part of this work unit," and "I feel a sense of ownership for this work unit rather than being just an employee." This adaptation of O'Reilly and Chatman's (1986) commitment questionnaire had a coefficient alpha of .85.

Workgroup performance. Perceived group performance was measured as members' responses to the following questions on a 5-point Likert scale: "How well do you think your work unit performs?" and "How effective is your work unit?" The coefficient alpha was .93. Actual group performance was assessed by departmental records (computerized production records and error reports) provided and standardized by the firm, and efficiency was assessed by supervisors' ratings of the groups. This firm has developed well-established outcome measures that are comparable across work units and that are updated biannually. Its Quality Assurance department is specifically designed to assess the productivity of work units. For example, to assess the performance of one top management team, Quality Assurance designed a 360-degree feedback system that included ratings

of members' performance by one another, users of their work (e.g., subordinates), and their vice presidents. We put this outcome into a standardized form to compare with other work units. To measure the performance of more routine task groups, such as one data entry group, the Quality Assurance team measured the number of data fields entered in a specified time period and deducted for data errors, along with measuring other unit tasks. Once again, we put the outcome into a standardized form for comparison with other units. This firm is considered a leader by others in the industry for the performance measures developed by its Quality Assurance department.

Workgroup efficiency was assessed by supervisors' ratings of two items measured on 7-point Likert scales, "How effective is this group at getting things done quickly?" and "How efficient is this work unit?" (1 = "Not at all Effective" to 7 = "Very Effective"). The Cronbach alpha for this two-item measure was .88.

RESULTS

Table 1 provides the means, standard deviations, and correlations for all variables in the model. Our three types of diversity are all statistically independent of each other.

Diversity and Conflict

Table 2 provides the regression analyses that tested H1 through H3. Supporting H1a, informational diversity was positively related to task conflict in workgroups. H1b, predicting that informational diversity would increase process conflict, was not supported. Support also was found for H2: social category diversity increased relationship conflict in workgroups. As predicted by H3, value diversity was positively and significantly related to all three types of conflict. Social category diversity and value diversity explained 21.9 percent of the variance in relationship conflict within the groups. Informational and value diversity explained 13.9 percent of the variance in task conflict; value diversity alone explained 10.3 percent of the variance in process conflict within workgroups.

Impact of Diversity on Performance and Worker Morale

We conducted regression analyses to test our hypotheses predicting the effects of workgroup diversity on worker morale and performance (H4 through H8). As shown in tables 3 and 4, below, the hypothesized relationships explain between 6.6 percent (workgroup efficiency) and 37.8 percent (commitment to workgroup) of workgroup performance and worker morale. Utilizing a procedure for cross-level analysis (Rousseau, 1985), we averaged individual responses on each of the independent and moderator variables for each work unit to create a group-level measure for the analysis of group-level dependent variables only (i.e., workgroup performance). We identified workgroups from a listing of who reports to whom, which was verified by the unit members. The average intragroup interrater agreement for each variable aggregated for the group performance equations was between .75 and .87. In addition, we calculated the ε^2, which indicates whether any two people in the same group

Table 1

Means, Standard Deviations, and Intercorrelations*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Value diversity	—												
2. Informational diversity	.05												
3. Social category diversity	.09	.08											
4. Relationship conflict	.16	.04	.07										
5. Process conflict	.13	−.07	.03	.63									
6. Task conflict	.33	.09	.06	.55	.55								
7. Interdependence	−.00	.19	.10	.05	.07	.06							
8. Task type	.29	−.24	−.25	.18	.07	−.02	−.15						
9. Commitment	−.19	.16	.09	−.41	−.30	−.31	.15	.16					
10. Satisfaction	−.17	.08	.14	−.50	−.39	−.41	.10	−.23	.28				
11. Intent to remain	−.18	.08	.08	−.42	−.29	−.29	.07	−.22	.29	.36			
12. Perceived performance	−.08	.02	.14	−.12	−.18	−.09	.05	−.09	.33	.26	.09		
13. Actual group performance	−.13	.20	−.07	−.29	−.36	−.29	−.01	−.01	.45	.46	.24	.29	
14. Group efficiency	−.16	−.03	−.03	.02	.06	.09	.06	−.10	.02	−.05	.12	.06	−.11
Mean	.99	.19	.35	2.22	1.87	2.64	2.22	3.01	3.44	4.44	3.37	4.22	3.97
S.d.	.33	.27	.28	1.21	1.02	1.02	0.74	0.59	0.99	1.20	1.45	0.57	0.73

* Correlations above .09 are significant at the .05 level.

Table 2

Regression Analyses Predicting Conflict ($N = 518$)

	Relationship conflict	Task conflict	Process conflict
Informational diversity (H1)	.02	.09•	−.06
Social category diversity (H2)	.08•	.05	.03
Value diversity (H3)	.15••	.37••	.13••
Adjusted R^2	.219	.139	.103
F	32.06•••	16.21•••	8.34••

• $p < .05$; •• $p < .01$; ••• $p < .001$.

are more similar than two people who are members of different groups (Florin et al., 1990). Our results, averaging .54, exceeded Georgopoulos's (1986) minimum criteria of .20, indicating that it was appropriate to aggregate the variables into group-level variables for the analysis of workgroup performance.

Workgroup performance. Table 3 presents the hierarchical regression analyses conducted to test the hypotheses about informational diversity and workgroup performance. Step 1 of the hierarchical regression includes the main effects of informational diversity, value diversity, social category diversity, and task type; step 2 includes the three hypothesized interactions (informational diversity × value diversity; informational diversity × social category diversity; and informational diversity × task type).

Informational diversity was positively related to actual workgroup performance. In support of H4, value diversity moderated the effect of informational diversity on actual performance and efficiency; informational diversity was more beneficial when there were low levels of value diversity than when there were high levels. In further support of H4, informational diversity was more positively related to efficiency when social category diversity was low. In support of H6, the interaction between informational diversity and task type

Table 3

Hierarchical Regression Analyses Predicting Workgroup Performance

	Perceived performance (N = 508)	Actual group performance (N = 87)	Group efficiency (N = 90)
Step 1: Main effects			
Informational diversity (ID)	.05	.30•••	−.05
Social category diversity (SC)	.16•••	−.07	−.03
Value diversity (V)	−.10•	−.12•	−.17••
Task type (T)	−.10•	−.05	−.06
R^2	.309	.127	.072
F	14.57•••	4.70•••	1.87•
Step 2: Interactions			
H4 ID × V	−.06	−.34•	−.75••
H4 ID × SC	.18	.25	−.44•
H6 ID × T	−.35•	−.74•••	−.53•
Change in R^2	.007	.021	.059
F change	.601	1.66•	2.33••
R^2	.316	.148	.131
Adjusted R^2	.284	.108	.066
F	10.13•••	3.78•••	2.90•••

• $p < .05$; •• $p < .01$; ••• $p < .001$.

was significant for all three measures of workgroup performance—perceived, actual, and efficiency; informational diversity was more likely to increase performance and efficiency when tasks were complex.

Hypothesis 7 predicted that the moderating effects of value diversity and social category diversity on the relationship between informational diversity and workgroup performance would be strongest when tasks are highly interdependent. Given the binormal distribution of interdependent and independent task groups, to get a clear picture of the three-way interactions, we dichotomized the groups into those that were highly interdependent (N = 57) and those that were highly independent (N = 35). In partial support of H7, the interaction between informational diversity and value diversity was more strongly related to performance when groups were interdependent (B = −.35, $p < .01$) than when members were independent (B = .09, n.s.), but interdependence did not similarly moderate the effects of the social category diversity and informational diversity interaction on workgroup performance.

Worker morale. H5 predicted that high value diversity and social category diversity would decrease the morale of workgroup members. As shown in table 4, more value diversity in the workgroup decreased satisfaction, intent to remain, and commitment of group members. In contrast, a higher level of social category diversity increased satisfaction, intent to remain, and commitment, opposite to what we had hypothesized. Hypothesis 8 predicted that value diversity and social category diversity would be more likely to affect morale when task interdependence is high. As shown in table 4, members in interdependent groups were more satisfied and felt more committed when high levels of social category diversity were present; however, these interactions did not significantly add to the variance explained by the main ef-

Table 4

Hierarchical Regression Analyses Predicting Worker Morale

	Satisfaction (N = 491)	Intent to remain (N = 412)	Commitment (N = 488)
Step 1: Main effects			
Informational diversity (ID)	.09	.06	.10•
H5 Social category diversity (SC)	.14••	.12••	.16•••
H5 Value diversity (V)	−.11•	−.19•••	−.19••
Interdependence (I)	.04	.03	.10•
R^2	.318	.167	.391
F	16.09•••	6.76•••	22.70••
Step 2: Interactions			
H8 V × I	−.19	−.22	−.10
H8 SC × I	.36•	−.13	.24•
Change in R^2	.009	.007	.002
F change	1.005	.900	.442
R^2	.327	.174	.393
Adjusted R^2	.313	.138	.378
F	13.22••	4.98•••	17.02••

• $p < .05$; •• $p < .01$; ••• $p < .001$.

fects. The interaction between value diversity and task interdependence was not significant.

Mediators of Diversity Effects

Hypothesis 9a predicted that task conflict would mediate the effects of informational diversity on workgroup performance. Using the procedure suggested by Baron and Kenny (1986), we found that the significant effect of informational diversity on actual group performance (B = .30, $p < .001$) became nonsignificant (B = .07, n.s.) when task conflict was controlled for. Thus, the mediating role of task conflict between informational diversity and actual group performance was confirmed. The results did not confirm hypothesis 9b, that process conflict would mediate the effects of informational diversity on workgroup performance. Results did confirm hypothesis 9c, which predicted that process conflict would mediate the effects of value diversity on worker morale. Value diversity was significantly related to the following dependent variables: satisfaction (B = −.11, $p < .05$), intent to remain (B = −.19, $p < .001$), commitment (B = −.19, $p < .01$), perceived performance (B = −.10, $p < .05$), actual group performance (B = −.12, $p < .05$), and group efficiency (B = −.17, $p < .01$). The effect of value diversity became nonsignificant when process conflict was included in the regression analyses on satisfaction (B = −.04) , intent to remain (B = −.05), commitment (B = −.05), perceptual performance (B = .04), and actual group performance (B = .03), meaning that value diversity accounts for the variation in these outcome variables through process conflict. Process conflict thus has a mediating role in the relationship of value diversity to satisfaction, intent to remain, commitment, perceptual performance, and actual group performance.

H9d predicted that relationship conflict would mediate the effects of value diversity and social category diversity on worker morale. Relationship conflict (mediator) was regressed on value diversity and social category diversity (independent variables) and found to be significant (Bs = .15, .08,

$p < .01, .05$, respectively). Second, value diversity was significantly related to the following dependent variables: satisfaction ($B = -.11$, $p < .05$), intent to remain ($B = -.19$, $p < .001$), commitment ($B = -.19$, $p < .01$), perceptual performance ($B = -.10$, $p < .05$), actual group performance ($B = -.12$, $p < .05$), and group efficiency ($B = -.17$, $p < .01$). Social category diversity was significantly related to the following dependent variables: satisfaction ($B = .14$, $p < .01$), intent to remain ($B = .12$, $p < .01$), commitment ($B = .16$, $p < .001$), and perceptual performance ($B = .16$, $p < .001$). Value diversity's effect became nonsignificant when relationship conflict was included in the regression analyses for satisfaction ($B = .01$) , intent to remain ($B = -.02$), perceptual performance ($B = .04$), and actual group performance ($B = .02$), meaning that value diversity accounts for the variation in these outcome variables through relationship conflict. Thus, for satisfaction and intent to remain, relationship conflict mediates between value diversity and worker morale.

Social category diversity's effect also became nonsignificant when relationship conflict was included in the regression analyses for satisfaction ($B = -.01$), intent to remain ($B = .05$), commitment ($B = .06$), and perceptual performance ($B = .01$). Thus, the mediating role of relationship conflict between social category diversity and worker morale was confirmed for satisfaction, intent to remain, and commitment.

DISCUSSION

The purpose of this study was to explore the differential impact of three group compositional factors (social category diversity, value diversity, and informational diversity) and two moderating variables (task type and task interdependence) on workgroup performance. With few exceptions (see Gruenfeld et al., 1996; Jehn, Chadwick, and Thatcher, 1997), past research has lumped social category diversity and informational and value diversity under the general heading of diversity in attempting to understand the impact of diversity on workgroup performance. In addition, even when distinctions have been made about types of diversity, previous research has typically been limited to studying one type of diversity but not others (e.g., O'Reilly and Flatt, 1989; Ancona and Caldwell, 1992). As a result, it is not surprising that a review of this literature produces different results across studies that purport to study the same thing—diversity and its impact on performance.

The present study was successful in distinguishing among three types of diversity and their impact on workgroup performance. While previous research has demonstrated the influence of conflict on workgroup outcomes (Jehn, 1995, 1997; Amason, 1996), the study described here takes the additional step of exploring how different types of diversity evoke conflict. The results show that different forms of diversity exacerbate different forms of conflict (within different task configurations), which in turn affects perceived performance, actual performance, satisfaction, intent to remain, and commitment. How these different types of diversity ultimately influence performance, both perceived and actual, is no simple story.

Before we review that story, however, we wish to acknowledge the limitations of this study. Because we did not have

access to the ethnic diversity of the participants in this study, our social category diversity results are based on the measurement of only two factors: age and gender. In addition, the study is cross-sectional, so that no causal inferences can be drawn. Finally, some of the variable measures are self-reported, and we cannot rule out the possibility of response-response bias in some of our analyses. To minimize this possiblity, however, we also included measures from archival data and multiple sources. For example, while different types of conflict, value diversity, the moderators, and many of the affective dependent variables (e.g., measures of morale, intent to remain, etc.) were self-reported, the two other diversity measures (social category and informational diversity), actual group performance, and workgroup efficiency were based on archival data or supervisory ratings. In addition, besides conducting multiple tests to assess the discriminant validity of the three types of conflict, future research should examine the transformation of one type of conflict into another. For instance, arguments about who is capable of doing what can often lead to relationship conflicts, and vice versa.

While most of our hypotheses received support in the predicted direction, we did have an unexpected finding. The finding that social category diversity resulted in increased relationship conflict, even though group members reported increased morale, runs counter to both conventional wisdom and past research. For example, Jehn (1995, 1997), among others (Pruitt and Rubin, 1986; Bettenhausen, 1991; Schwenk and Valacich, 1994), illustrated how relationship conflict is associated with a general reduction in worker morale. One explanation for this finding may be the particular variables that compose the social category diversity variable in this study. It may be that at least for age, diversity on this factor reflects lower levels of intragroup competition, as workers are more likely to be competing with similar (in age) others for various valued organizational resources. But this inconsistency, coupled with the cross-sectional nature of the data, suggests at least one plausible, alternative explanation. It may be that high performance leads to high morale and low task conflict rather than, in our interpretation, that low task conflict leads to high morale and high performance.

We explored this alternative explanation by positing that a third variable, group performance, may be affecting the relationship between social category diversity and worker morale such that it would overwhelm the negative effects of relationship conflict on morale. In fact, follow-up analyses demonstrated that performance mediated the impact of social category diversity on morale. While, as noted above, social category diversity was significantly related to satisfaction, intent to remain, perceived performance, and commitment, these effects became nonsignificant when group performance was included in the regression analyses. Thus, the mediating role of performance between social category diversity and worker morale was confirmed for satisfaction, intent to remain, perceived performance, and commitment. Diverse groups performed better and perhaps, therefore, were more pleased with the group in which they

were working, independent of its level of social category diversity.

From this study we can identify the types of diversity that are associated with various types of performance. For a team to be effective, members should have high information diversity and low value diversity. For a team to be efficient, members should have low value diversity. For a team to have high morale (higher satisfaction, intent to remain, and commitment) or to perceive itself as effective, it should be composed of participants with low value diversity. What these consistent findings suggest is the value, for most measures of group performance, of low value diversity among members. Moreover, it may also be that value diversity, which is often not immediately discernible, becomes more important as a predictor of group performance over time, while age and gender diversity, characteristics that are readily apparent, become less relevant over time. The importance of low value diversity on workgroup performance over time is also supported by results of a recent field study of research and development teams (Owens and Neale, 1999).

The most arresting aspect of this study may be the window it provides into our understanding of the importance of value diversity to both workgroup performance and worker morale. Thus, it seems that certain types of similarity are dramatically more important than others, despite the assumption that people generally strive for similarity among those with whom they interact (Byrne, 1971). It is the diversity associated with values, and not social category, that causes the biggest problems in and has the greatest potential for enhancing both workgroup performance and morale.

This study suggests, like Williams and O'Reilly (1998), that the impact of diversity goes well beyond simple main effects. Task interdependence and task type moderate the relationships between diversity and various measures of performance. Informational diversity is more likely to lead to improved performance when tasks are nonroutine. Again, social category diversity unexpectedly led to greater satisfaction and commitment when task interdependence was high than when it was low. It is more difficult here to explain away this finding by deferring to the performance-morale path. It may actually be that social category diversity results in higher morale in interdependent tasks. Being able to work together successfully, even when the group is diverse with respect to age and gender composition, may result in greater morale because the group has overcome a serious challenge to its effectiveness. Further, these groups may have discovered that the social category differences were not good signals of value diversity. This interpretation received support from earlier research. For example, several studies in the 1960s (Byrne and Wong, 1962; Stein, Hardyck, and Smith, 1965) found that whites preferred blacks with attitudes similar to their own over whites with opposing attitudes, but this effect of value similarity on racial attitudes apparently has been ignored in recent years, as researchers have used similarity in attributes such as race or gender as surrogates for value similarity. Further, it appears from the work of Owens and Neale (1999) that groups are aware of some of the impact of different types of diversity on perfor-

mance and can select team members for their contributions along multiple diversity dimensions that enhance group performance. Taken as a whole, these results provide direction for creating and managing diverse teams to enhance performance. Our results suggest that diversity itself is not enough to ensure innovation; the nature of the team's diversity is critical. For group members to be willing to engage in the difficult and conflictful processes that may lead to innovative performance, it seems that group members must have similar values.

Our results also shed light on the difficulty of studying social category diversity. One problem associated with attempting to make predictions about the effects of social category diversity on workgroup performance is that social category diversity may represent informational diversity, value diversity, both, or neither. Since social category diversity is not necessarily associated with either informational or value diversity, it poses prediction problems for researchers and signaling problems for group members. What does being the only woman in an otherwise all-male group mean about the unique perspectives that an individual brings to the group? If the task of the group is to define a strategic direction for the organization, and all group members have backgrounds in finance, it is not likely that the gender of one member will make a significant difference in the information that an individual brings to the group. If the group must select product features for a new model of automobile, however, the experience of being a woman may bring a different orientation to the discussion, even if that woman is an engineer, just like everyone else in the group. Finally, are all categorical variables equally influential? Are there ebbs and flows of influence of these categorical variables as teams age and evolve? While clearly important questions, we must await future research for the answers.

Unlike demographic characteristics, the characteristics of value and informational diversity are not easily discernible from a quick physical inspection of fellow group members the way that social category characteristics often are. Thus, because of their ease of observation, demographic characteristics, in particular, are more likely to be incorporated into the heuristic information processing of group members as they develop mechanisms to manage group processes and complete assigned tasks. Just as past researchers may have relied on social category diversity as a surrogate for informational and value diversity, social category similarity may lead group members to overlook important sources of informational and value diversity or to assume similarity where it does not exist.

Our findings—specifically, distinguishing among different types of diversity and their differential effects—may help reconcile some of the inconsistencies in past research. If the type of diversity measured is informational diversity, group performance may be enhanced by diversity. If the type of diversity measured is social category diversity, the most positive effects will likely be on worker morale (satisfaction, intent to remain, commitment, and perceived performance). In contrast, groups that have greater diversity as measured in terms of values may suffer significant performance decre-

ments (being less effective and efficient as well as having poorer perceived performance) and diminished worker morale (decreased satisfaction, commitment, and intent to remain in the group). While the story told in previous research, even with its contradictory findings and inconsistent empirical support, may have been easier to tell—heterogeneity leads to better workgroup performance and homogeneity leads to easier workgroup process—the more complex representation of these relationships as provided by this paper should enhance our understanding of the ways to create, intervene in, and manage high-performance groups and teams.

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