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Capitalizing on Diversity:
Interpersonal
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We examine interpersonal congruence, the degree to which group members see others in the group as others see themselves, as a moderator of the relationship between diversity and group effectiveness. A longitudinal study of 83 work groups revealed that diversity tended to improve creative task performance in groups with high interpersonal congruence, whereas diversity undermined the performance of groups with low interpersonal congruence. This interaction effect also emerged on measures of social integration, group identification, and relationship conflict. By eliciting self-verifying appraisals, members of some groups achieved enough interpersonal congruence during their first ten minutes of interaction to benefit their group outcomes four months later. In contrast to theories of social categorization, the interpersonal congruence approach suggests that group members can achieve harmonious and effective work processes by expressing rather than suppressing the characteristics that make them unique. ●

Diversity has recently captured the attention of those interested in group performance. Group members can differ in functional specialization and demographic or cultural identities, such as age, race, sex, and citizenship (e.g., Pfeffer, 1983; Milliken and Martins, 1996; Jehn, Northcraft, and Neale, 1999; Chatman and Flynn, 2001), and a group's diversity is defined by the heterogeneity of all such individual attributes within a group (Blau, 1977; Williams and O'Reilly, 1998). Proponents of diversity hold that differences among group members give rise to varied ideas, perspectives, knowledge, and skills that can improve their ability to solve problems and accomplish their work. This value-in-diversity hypothesis has received some empirical support (e.g., Watson, Kumar, and Michaelsen, 1993; Jehn, Northcraft, and Neale, 1999; Ely and Thomas, 2001). Skeptics, however, counter that members of different social categories tend to view each other through the biased lens of category stereotypes and that these biases decrease the effectiveness of group interaction (for a review, see Williams and O'Reilly, 1998). Recently, several authors have attempted to reconcile these contrasting viewpoints by suggesting that diversity is a double-edged sword, improving group performance on some tasks but, all too often, disrupting group processes (Guzzo and Dickson, 1996; Milliken and Martins, 1996; Pelled, Eisenhardt, and Xin, 1999).

Efforts to capitalize on diversity over the last four decades have met with frustratingly equivocal results (Guzzo and Dickson, 1996). In response, researchers have intensified their efforts to understand why diversity is so often disruptive. To this end, most studies have relied on social identity theory (Tajfel, 1982) or self-categorization theory (Turner et al., 1987) to explain diversity's harmful effects. These theories suggest that greater diversity will cause workgroup members to employ divisive social categorizations based on their demographic or functional differences instead of using the inclusive workgroup boundary as the basis for categorization (e.g., Kramer, 1991; Northcraft et al., 1995). Categorizing other workgroup members into an ingroup (those who are like me) and an outgroup (those who are different) causes people to

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accentuate perceptions of their similarities with ingroup members as well as their differences from outgroup members (Tajfel, 1978; Brewer, 1979). Such intergroup categorizations among workgroup members increase dysfunctional conflict and turnover while undermining cohesion, social integration, informal communication, and, consequently, group performance (e.g., Tsui, Egan, and O'Reilly, 1992; Smith et al., 1994; Pelled, Eisenhardt, and Xin, 1999).

This reasoning has triggered a search for moderators of the harmful effects of diversity caused by social categorization processes. Harrison, Price, and Bell (1998) found that group longevity diminished the negative effect on group cohesion of surface-level diversity (e.g., sex diversity) but strengthened the negative effect on group cohesion of deep-level diversity (e.g., diversity in overall work satisfaction). Westphal and Milton (2000) discovered that demographic-minority members of corporate boards overcame detrimental social categorization processes and exerted more influence when they were either socially tied to others on the board or relatively experienced in the role of minority board member. Chatman et al. (1998) found that compared with an individualistic organizational culture, a collectivistic culture enhanced social interaction and creative performance to a greater degree in diverse groups than in homogeneous groups. Consistent with self-categorization theory, a collectivistic culture made the organizational boundary more salient than demographic categories as the basis for social categorization, facilitating harmonious interaction and creativity among demographically different people.

Research inspired by self-categorization theory, then, suggests that inducing group members to replace cross-cutting demographic or functional categories with the inclusive workgroup boundary as the basis for social categorization will reduce the detrimental effects of intergroup biases (Kramer and Brewer, 1984; Gaertner et al., 1989; Polzer, Stewart, and Simmons, 1999). Such a recategorization should cause workgroup members to replace their personalized self-conception with a cognitive representation of themselves (and other group members) as embodiments of a workgroup prototype (Hogg and Terry, 2000). Such depersonalization heightens group members' perceived similarities and attenuates their perceived differences (Turner, 1985), reducing the detrimental effects of categorical diversity.

For those interested in capitalizing on the value in diversity, however, self-categorization theory's solution to problems associated with diversity may be costly. Although evoking a collective categorization may minimize the use of category-based biases and stereotypes (e.g., for organizational functions such as accountant, engineer, and salesperson and personal characteristics like sex, race, and age), it may also discourage individuals from thinking and acting in ways associated with their unique category memberships (Gaertner et al., 1989). Yet it is precisely these unique ways of thinking and acting that constitute the potential positive contribution of a diverse workgroup. Therein lies the quandary: how can group members simultaneously avoid the pitfalls of inter-

group categorizations while fully utilizing the perspectives of their distinct category memberships?

Although abundant anecdotal evidence suggests that diverse groups sometimes do emphasize their differences and simultaneously become socially integrated, how this happens is unclear. Williams and O'Reilly (1998: 119), for example, suggested that successfully managing conflict, increasing familiarity, and fostering collectivistic norms might help, but they then asked: "what is the theoretical basis of these effects?" Unfortunately, social categorization theories offer little insight into how diverse groups interact effectively while remaining cognizant of their differences.

Ely and Thomas (2001) recently provided one answer to this question by proposing that a group's "diversity perspective"—group members' normative beliefs and expectations about cultural diversity and its role in their workgroup—moderates the effect of cultural identity diversity (e.g., sex, race) on workgroup functioning. Their qualitative study of three organizations revealed that groups that approached their diversity from an "integration-and-learning" perspective were able to utilize their differences to improve their core work processes and outcomes. This perspective holds that members of various cultural identity groups develop distinctive insights, skills, and experiences that can help the workgroup reevaluate its primary tasks and processes, and this diversity is viewed as "a resource for learning and adaptive change" (p. 240). Group members working with this perspective reported feeling that their "whole person" was known, valued, and respected by others and that they could express "more of who they were" at work, including those things that differentiated them from others (pp. 254, 258). It was through these intervening processes that an integration-and-learning perspective ultimately enhanced group performance (Ely and Thomas, 2001).

The processes through which people come to know one another, such as learning about others' differences and sharing one's own self-relevant thoughts and feelings, should enhance group effectiveness because they increase interpersonal congruence, defined as the degree to which group members see others in the group as others see themselves. The interpersonal congruence in the group should moderate the effect of diversity on workgroup functioning by allowing group members to attenuate the negative effects of diversity without requiring them to relinquish their divergent characteristics and identities. Our goal in this paper is to theoretically justify and empirically test this moderating effect.

INTERPERSONAL CONGRUENCE AS A MODERATOR OF DIVERSITY

The notion of interpersonal congruence arises from the social psychological framework of identity negotiation (Goffman, 1959; Swann, 1987), which in turn grew out of the writings of the early symbolic interactionists (e.g., Cooley, 1902; Mead, 1934). These early writers were interested in how people formed feelings and beliefs about themselves, or self-views. They argued that individuals infer who they are based on how others treat them. For example, whereas those who

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are applauded for their imagination will come to view themselves as creative, those who are scorned for their stupidity will develop negative views of their intelligence.

Clearly, however, people are not just milquetoasts who passively sit back as targets of others' treatment and absorb any identity-relevant information that they encounter. Instead, part of the business of constructing who one is involves active efforts to influence others' appraisals of oneself (Goffman, 1959). If, for instance, people view themselves as creative or intelligent or trustworthy, they will try to bring their partners to appraise them congruently by acting the part. Their actions will, in turn, increase the chances that their partners will indeed come to see them congruently, that is, as they see themselves (Swann, 1983, 1996).

Taken together, these efforts should lead to greater alignment between self-views and appraisals by others. The degree of similarity between a person's self-views and others' appraisals of that person constitutes the interpersonal congruence between them. Interpersonal congruence varies along a continuous dimension from high congruence (i.e., agreement between people's self-views and the appraisals of their partners) to low congruence (disagreement between people's self-views and the appraisals of their partners). We assume that interpersonal congruence, and the identity negotiation processes that give rise to it, are neither static nor objective but, instead, are constructed from the dynamic and subjective perceptions of interaction partners. This assumption parallels related notions that cultural identity is socially constructed and dynamic, such that people can exert some control over how they are viewed and the contexts in which they operate (Ely and Thomas, 2001).

High interpersonal congruence should foster harmonious and productive interactions for at least two reasons. First, when people sense that they are perceived congruently, they can rest assured that their self-views—which are the lenses through which they perceive reality—are correct. As a result, their feelings of coherence, predictability, and control will be bolstered (e.g., Swann, Stein-Seroussi, and Geisler, 1992). Second, insofar as people sense that others see them congruently, they will know how to behave and how their interaction partners are apt to react to them. This knowledge will facilitate smooth social interaction and enhance the chances that people will achieve the goals that brought them to the interaction. Thus, for both of these reasons, people should prefer and seek congruent, self-verifying appraisals.

A growing body of research supports the proposition that people want to be known for who they believe they are. When people enter into relationships with others who verify their self-views, for example, they will feel more intimate and satisfied with the interaction (Swann, De La Ronde, and Hixon, 1994; De La Ronde and Swann, 1998) and more inclined to want to continue the relationship (Swann and Pelham, 2002). So powerful is this desire for self-verifying feedback that even when people have negative self-views, they work to verify them by eschewing positive feedback in favor of negative, verifying feedback (Swann, Pelham, and Krull,

1989; for overviews, see Swann, 1996; Swann, Rentfrow, and Guinn, 2002). This preference for self-verification means that increments in congruence should produce rich psychological and social dividends for the participants in the interaction.

To illustrate interpersonal congruence in a team context, imagine a team member who views himself as highly creative and, in accord with this self-view, frequently expresses unusual ideas about the tasks at hand. If other group members appraise him as a creative type, they are likely to be a receptive audience for his ideas, and he should fit into the group harmoniously. In contrast, if group members think he is relatively uncreative, they may deem his ideas to be distracting and even annoying. In the latter case, others are more likely to exchange knowing glances and scoff at his ideas than to consider their merit fully. Moreover, they are unlikely to seek his specific input on portions of the task requiring creative solutions, precisely the type of input he feels most qualified to provide. Over time, such treatment may erode his desire to contribute and, ultimately, to belong to the team.

Consider a second example in which a person is thrust into a leadership role by her team members, who think she is best suited to take charge of the team when they encounter unexpected turbulence. If she views herself as a capable team leader, she is likely to welcome their high expectations and smoothly take charge. If she does not think of herself as a strong leader, however, others' high expectations may provoke deep anxiety and uncertainty, which may hamper her ability to lead the team. As this example demonstrates, appraisals that exceed a person's self-views can be as troublesome as appraisals that fall short of self-views. Both sources of incongruence can undermine effective interaction.

Our focus on the relation between people's self-views and the appraisals of their partners distinguishes our conception of interpersonal congruence from a variety of other types of congruence, such as congruence in behaviors (e.g., Floyd, 1999), perceptions of communication (e.g., Schnake et al., 1990), and congruence between people and organizations (e.g., Chatman, 1991). Another somewhat related construct is identity comprehension, which Thatcher (2000: 1) studied in a group context and defined as "the degree to which team members know and are able to identify those identities that are most important to the focal individual" (see also Thatcher, Doucet, and Tuncel, 2002). Identity comprehension, however, is distinct in its focus on whether perceivers recognize the importance that targets place on a characteristic (e.g., creativity is important to the target); interpersonal congruence, in contrast, is concerned with perceivers' appraisals of the target's standing on a characteristic (e.g., the target is very creative). Swann, Milton, and Polzer (2000) found that self-verification—the extent to which targets brought other group members to see them congruently over time—increased both feelings of connectedness among group members (e.g., social integration, group identification, and reduced relationship conflict) and creative task performance. A second route to congruence—group members' appraisals influencing targets' self-views over time—did not significantly influence

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feelings of connectedness or creative task performance. But neither Thatcher (2000; Thatcher, Doucet, and Tuncel, 2002) nor Swann, Milton, and Polzer (2000) examined the interplay between identity-related constructs and diversity, the topic of this paper.

A clear distinction can be drawn between our interpersonal congruence approach and self-categorization theory. Whereas self-categorization theory suggests that people should surrender their personal identities to achieve group harmony, the identity negotiation framework in general, and the self-verification perspective in particular, suggests that people should externalize their self-views to bring others to see them as they see themselves (i.e., congruently). The identity negotiation framework thus identifies processes that increase congruence as those through which diverse group members can work together harmoniously and effectively, without requiring them to suppress the individuating characteristics that make them unique.

Among members of homogeneous groups, social categorization processes and the tendency for similar people to be attracted to each other (Byrne, 1971) may smooth members' social interactions. For this reason, an abundance of interpersonal congruence may contribute little to the already high levels of group functioning in homogeneous groups. In contrast, more diverse groups do not enjoy the advantages associated with similarity and its covariates and are more likely to suffer from dysfunctional intergroup biases that undermine group functioning. Yet, theoretically, even categorically dissimilar group members may achieve high levels of interpersonal congruence. Just as harmful intergroup categorization processes are more likely to occur as group diversity increases, so the benefits of interpersonal congruence are more likely to offset such harm in groups with greater diversity.

This reasoning suggests that the effect of greater diversity on group functioning is likely to depend on the level of interpersonal congruence in the group. When interpersonal congruence is low, the negative effects of increased diversity on group functioning may go unchecked. When interpersonal congruence is high, however, the mutual understanding and appreciation for one another's perspectives it fosters may buffer the group from the potentially disruptive effects of diversity.

Social Integration, Group Identification, and Intragroup Conflict

Interpersonal congruence should moderate the consequences of diversity on several potent indicators of group functioning, including social integration, group identification, and intragroup conflict. Social integration refers to the degree to which group members are attracted to the group, feel satisfied with other members, interact socially with them, and feel psychologically linked to one another (Katz and Kahn, 1978; O'Reilly, Caldwell, and Barnett, 1989; Smith et al., 1994). Groups whose members are more socially integrated should be able to coordinate their efforts and integrate their perspectives more effectively and efficiently, yielding a coherent and timely final product (Shaw, 1981). Group identifica-

tion is the perception of oneness with or belonging to the group (Mael and Ashforth, 1992), involving cognitive, affective, and evaluative dimensions (Tajfel, 1982). Members who identify strongly with their group should cooperate more with group interests and exert greater effort on behalf of the group (O'Reilly and Chatman, 1986; Kramer, 1991).

Researchers have distinguished two particularly important types of intragroup conflict. Relationship conflict is defined as interpersonal incompatibility accompanied by tension, annoyance, and frustration (Jehn, 1995, 1997; Pelled, Eisenhardt, and Xin, 1999). This type of conflict has few redeeming qualities and tends to have a negative impact on performance (Jehn, 1997). Group members embroiled in relationship conflict may be unreceptive to others' ideas and unwilling to share their own (Pelled, 1996) and may eventually disengage psychologically or physically from the group (Ross, 1989). Relationship conflict is conceptually distinct from task conflict, defined as disagreement about the tasks being performed, including such issues as priorities, goals, alternatives, and appropriate choices for action (Jehn, 1995, 1997; Pelled, Eisenhardt, and Xin, 1999). Moderate task conflict is associated with an exchange of ideas and opinions, which leads to a more complete understanding of issues and alternative solutions and culminates in optimal decisions (Tjosvold, 1986; Schweiger, Sandberg, and Rechner, 1989; Amason, 1996).

Self-categorization theory and the similarity-attraction hypothesis predict that diversity will undermine team members' social integration and group identification, while fueling relationship conflict (Williams and O'Reilly, 1998). While such deleterious consequences of diversity may readily occur in teams with low interpersonal congruence, these negative effects should be reduced in teams with high interpersonal congruence. People who verify each other's self-views should not only understand how they differ, but also come to expect differing behavior, which should in turn make it easier to tolerate behaviors that might otherwise disrupt the relationship. Interpersonal congruence should thus lessen the frustration and anger that may arise during intensive work interaction, especially among people with differing viewpoints and perspectives. This prediction is consistent with research showing that self-verification leads to positive emotional responses, while the lack of self-verification (or incongruence) can lead to negative emotional responses (Burke and Stets, 1999). We expect this reasoning to apply directly to factors that tap into team members' affective responses, including social integration, group identification, and relationship conflict:

Hypothesis 1: High interpersonal congruence will attenuate the negative effect of diversity on social integration and group identification and the positive effect of diversity on relationship conflict.

Predicting the interactive effect of interpersonal congruence and diversity on task conflict requires more nuanced reasoning. Diverse groups should have more potential for task conflict by virtue of having more varied ideas and perspectives about the task (Jehn, Northcraft, and Neale, 1999), but this

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requires that team members voice their ideas and engage in task conflict. Because people's self-views are associated with their backgrounds, experiences, and perspectives (Ely and Thomas, 2001), having their self-views verified by other group members may make them feel more comfortable expressing their unique ideas and perspectives. If interpersonal congruence increases the number of divergent ideas people express about task issues, this could increase task conflict to the greatest degree in highly diverse groups.

Conversely, even if team members express many task-related ideas, the level of interpersonal congruence may affect whether they interpret their discussion of these ideas as conflict. After all, conflict implies not just differing ideas but some degree of emotional friction caused by their expression, which explains why relationship conflict and task conflict are typically highly correlated (Simons and Peterson, 1999). Assuming that people's ideas correspond with their self-views (e.g., people who view themselves as analytical tend to focus on the logic of various alternatives), interpersonal congruence should make others' contributions more predictable and defuse any sense of personal threat associated with a divergent opinion. Ideally, the net effect of high interpersonal congruence may be that group members express their unique task-related ideas with little accompanying friction or frustration, effectively dispelling the conflict that so often erupts between people with discrepant ideas. This reasoning suggests the following hypothesis for task conflict:

Hypothesis 2: High interpersonal congruence will attenuate the positive effect of diversity on task conflict.

Group Performance

Interpersonal congruence and diversity may jointly influence task performance. Beyond simply nullifying the detrimental effects of diversity on social integration, group identification, and conflict, high levels of interpersonal congruence may enable diversity to have a positive effect on task performance. High interpersonal congruence should encourage group members to apply to the task the differences in knowledge, experiences, perspectives, and networks associated with their cultural identities and categorical differences (Ely and Thomas, 2001). Groups that openly deliberate their diverse perspectives are likely to be more creative (Amabile et al., 1996) and generate more alternatives for novel solutions than groups that do not (Nemeth and Kwan, 1987; Smith, Tindale, and Dugoni, 1996). The more unique ideas a group generates to solve its work problems, the more likely it is to consider a wide variety of relevant information and, ultimately, discover solutions that are original and appropriately complex (Paulus, Larey, and Dzindolet, 2001). Beyond encouraging members to generate more ideas, high interpersonal congruence should provide a foundation for members to challenge others' ideas fully while finding ways to integrate their disparate perspectives. Such processes are essential for effective group decision making (Dean and Sharfman, 1996).

The performance benefit of interpersonal congruence should be most evident on creative group tasks, which have no clearly defined criterion and for which the group benefits by considering as many perspectives and alternatives as possible (Hambrick et al., 1998). In contrast, there is less reason to expect such a performance benefit on computational tasks, which involve assembling and analyzing clear-cut information to derive a solution that has an objective criterion (e.g., a math problem) and might best be left to an individual with expertise relevant to the task. This distinction between creative and computational tasks parallels the distinction between judgmental and intellectual tasks (Laughlin, 1996). These and related typologies classify tasks in part according to how routine or interdependent they are (Steiner, 1972; Van de Ven, Delbecq, and Koenig, 1976; McGrath, 1984; Wageman, 2001), distinctions that help to explain when diversity will be most beneficial (Jackson, 1992; Pelled, Eisenhardt, and Xin, 1999; Jehn, Northcraft, and Neale, 1999). Diverse groups with high interpersonal congruence should exhibit the highest creative task performance. This implies that the level of interpersonal congruence will moderate not just the strength but also the direction of the effect of diversity on creative task performance:

Hypothesis 3: Under low levels of interpersonal congruence, increased diversity will have a negative effect on creative task performance, while under high levels of interpersonal congruence, increased diversity will have a positive effect on creative task performance.

We have predicted that interpersonal congruence will moderate the effect of diversity on several indicators of group process as well as creative task performance. Several studies have demonstrated that social integration, group identification, relationship conflict, and task conflict affect group performance (e.g., O'Reilly, Caldwell, and Barnett, 1989; Smith et al., 1994; Jehn, 1995; Jehn, Northcraft, and Neale, 1999; Pelled, Eisenhardt, and Xin, 1999). Taken together, these considerations suggest that these group process indicators will mediate the interactive effect of diversity and interpersonal congruence on creative task performance:

Hypothesis 4: The moderating effect of interpersonal congruence on the relationship between diversity and creative task performance will be mediated by social integration, group identification, relationship conflict, and task conflict.

We tested our hypotheses in a longitudinal study of small groups of first-year students in a graduate business degree program.

METHOD

Participants

Participants were 423 first-semester Master's of Business Administration (MBA) students at the University of Texas at Austin. Most participants were male (74 percent) and U.S. citizens (82 percent). Of the total, 67 percent were Caucasian, 17 percent were Hispanic, 11 percent were Asian, and 5 percent were African American. The mean age was 27 years.

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Prior to the beginning of the semester, the administration of the Graduate School of Business assigned members of the incoming MBA class to 83 study groups with four to six members per group. To enhance pedagogical opportunities, team assignments were designed to maximize within-team diversity by using a sorting algorithm coupled with random assignment. The algorithm maximized team diversity along the dimensions of sex, ethnicity, country of origin, previous job experience (including function and industry), and proposed functional concentration in the MBA program. Once assigned, members of each group were required to complete group project assignments with their group in the majority of the required courses during their first semester. Because these group projects accounted for a substantial portion of students' individual course grades, we were confident that participants would take seriously their involvement in the study groups.

Procedure

We measured participants' self-views and appraisals of others at the beginning and shortly after the midpoint of the semester. To capture initial interpersonal congruence, we measured self-views immediately prior to the groups' initial meeting and appraisals as soon after the groups' initial meeting as was possible. We measured participants' self-views either one or two days (depending on their session) before they learned of their study-group assignment. To enable this early measurement and to guide the groups' initial interaction, we conducted our first two data collection sessions during the orientation week for entering MBA students sponsored by the Graduate School of Business. We introduced the first session by asking students to participate in an investigation of the characteristics of effective study groups. We told students that their participation would involve completing a series of four questionnaires over the fall semester and that only members of the research team would see their responses. Participants then completed the initial measure of self-views along with control measures of work style preferences and prior experience working in teams (Time 1a). Over the next two days, participants returned in seven assigned cohorts of about 60 students each for the second session (Time 1b). After announcing the group assignments at the beginning of the session, we allowed groups to interact for 10 minutes. After this interaction, all participants returned to their seats and recorded their appraisals of each of the other members of the group. We controlled the order in which participants rated each other group member to ensure that ratings were not biased by order effects. We timed the next session (Time 2) so that it occurred nine weeks into the semester, presumably after students had had time to interact and work together and, in so doing, sort out their mutual identities. Participants completed measures of their self-views and appraisals of other team members during this session. Finally, at the end of the semester (Time 3) we collected measures of group functioning. After the semester concluded, we were able to collect group project grades from 10 of 15 course instructors and archival demographic data from program administrators.

Independent Variables

Group diversity. We measured group diversity along seven dimensions. We used the coefficient of variation (standard deviation divided by the mean) to calculate age diversity, which was the only continuous diversity dimension. We used Blau's (1977) heterogeneity index to compute group diversity scores for each of the six remaining categorical dimensions. This index is calculated with the formula:

$$1 - \sum p_i^2$$

where p is the proportion of the group in the i th category. A higher index score indicates greater diversity among team members along the particular dimension. These categorical dimensions included U.S. citizenship, race, sex, previous degree, MBA concentration, and previous job function. Race categories included African American, Asian, Caucasian, and Hispanic. We coded previous degree into five categories (business, engineering, liberal arts, science, and other), and previous job function into six categories (finance/accounting, marketing, engineering/research and development, general management/management consulting, military, and other). We borrowed the categories used by program administrators to classify participants' MBA concentration. Like Chatman and Flynn (2001) and others (e.g., Jehn, Northcraft, and Neale, 1999), our theoretical focus was on an amalgamation of differences rather than on the specific content of any single difference. Accordingly, we aggregated these seven dimensions into two composite diversity measures: *demographic diversity*—age, sex, race, and citizenship—and *functional diversity*—previous degree, previous job function, and MBA concentration.

Interpersonal congruence. Congruence on characteristics that are highly valued by group members may have more impact than congruence on relatively trivial dimensions. Moreover, agreement among group members on the value of particular characteristics may add to the benefits of congruently perceiving people's standing on those characteristics. Despite this potential variation in how people judge the worth of characteristics, some core self-views are likely to be relatively important across contexts. We addressed this issue by focusing on a cluster of characteristics that previous research and pilot testing on a separate sample of comparable students identified as highly important to our participants.

Students rated both themselves and each of the other members of their study group on 11 dimensions. We took four dimensions (intellectual/academic ability, creative and/or artistic ability, social skills/social competence, and competency or skill at sports) from the short form of the Self-Attribute Questionnaire, which consists of self-views that are central to perceptions of self-worth (Pelham and Swann, 1989). We derived six additional items from a preliminary survey in a previous semester of 110 MBA students in which they indicated the importance to them of each of 37 characteristics and abilities that we deemed potentially relevant to team-

work. The results of the survey indicated that the following six characteristics were particularly important: trustworthy, leadership ability, cooperative, a hard-worker, fair, and competitive. We also added one final item to tap people's global positive versus negative impressions of the target of the rating: competent and likable in general. For each of the 11 dimensions, participants rated themselves at T1a and T2 and the other members of their study group at T1b and T2. Participants rated themselves and others on each dimension relative to other first-year MBA students in the university on 10-point, percentile-based scales.

To calculate group-level interpersonal congruence scores between T2 self-views and T2 appraisals (hereafter called *T2 congruence*), we first calculated an individual-level congruence score for each participant. In doing so, we treated each group member as both a target of others' appraisals and as a perceiver of each of his or her group members. For each of the 11 dimensions, we found the absolute value of the discrepancy between a participant's self-view and each other group member's appraisal of that participant. We then calculated the average absolute value of these discrepancies across all the group members who appraised that participant. This resulted in each participant having a single congruence score for each of the 11 dimensions. For each participant, we then calculated the mean congruence score across the 11 dimensions (Cronbach's $\alpha = .79$). This resulted in each participant having a single congruence score.¹ We judged this measure of interpersonal congruence (the absolute value of the discrepancy between a self-view and an appraisal) to be the most direct operationalization of our conceptual definition of interpersonal congruence. Other measures of the interplay between self-views and appraisals, such as a Euclidean distance measure, a correlation approach, or an interaction approach, exhibit subtle distinctions that are not consistent with our conceptual definition (e.g., they are influenced disproportionately by extreme differences or by differences that reside at extreme ends of the scale). By contrast, our theory and operationalization treat all discrepancies of the same magnitude equally. We aggregated the individual congruence scores by averaging across all the members of a group to arrive at a group-level congruence score.² This aggregation was justified because workgroups accounted for a significant amount of variance in T2 congruence [$F(82, 323) = 1.79, p < .001$; intraclass correlation = .14].

We constructed two measures of the building blocks of T2 congruence. We first computed congruence between T1a self-views and T1b appraisals with the same set of calculations we used to compute T2 congruence (Cronbach's $\alpha = .72$ for T1 congruence scores on the 11 dimensions). Variation in this measure of initial congruence most plausibly resulted from people eliciting different levels of verification for their T1a self-views, as indicated by their group members' T1b appraisals of them. After all, group members could not have influenced one another's T1a self-views, which were measured before they met. Accordingly, we labeled this initial measure of congruence *T1 verification*. Between our T1 and T2 data collection sessions, participants had ample

1

Many oft-cited concerns about difference scores do not apply to our findings (Johns, 1981; Edwards, 1994a, 1994b; Tisak and Smith, 1994). For example, we used the difference between ratings made by different individuals, not by the same person, and all congruence ratings in our study use the same items and the same scale. We included the component variables—mean self-views and mean appraisals—in the regression equations as controls to ensure that the effects of interpersonal congruence would not be spurious effects of one of the components. Using Levene's test for equality of variances (Snedecor and Cochran, 1989), we confirmed that the variance of self-ratings and appraisals as reported in table 1 (below) did not differ significantly. This was true for T1 ($F = 0.27, p = .60$) and T2 ($F = 1.82, p = .18$). These and related analyses ensured that our operationalization of congruence provided a reliable and direct test of our hypotheses.

2

Swann, Milton, and Polzer (2000) used a related measure to find that groups benefited most from self-verification effects. Their index of self-verification effects consisted of the change in the average appraisal of other group members (toward participants' initial self-views) from just after the group members met to several weeks later. This measure is conservative because it does not capture identity negotiation processes that occur in the critically important first few minutes of interaction (Kenny et al., 1992). Because we wanted our index of T2 congruence to capture identity negotiation processes that occurred as soon as participants met as well as those that unfolded later, we abandoned Swann, Milton, and Polzer's index of self-verification in favor of our index of T2 congruence. Thus, our tests of T2 congruence focused on how the aggregate level of congruence in the group interacted with diversity to affect group functioning. In addition, our measure of T1 verification provided a direct test of the moderating effects of self-verification that occurred during participants' first few minutes of interaction.

opportunity to influence one another's self-views and appraisals. We measured the resulting *change in congruence* by subtracting T1 verification from T2 congruence. Workgroups accounted for a significant amount of variance in both T1 verification [$F(82, 270) = 1.69, p < .001$; intraclass correlation = .14] and the change in congruence between T1 and T2 [$F(82, 258) = 1.58, p < .004$; intraclass correlation = .12], justifying their aggregation to the group level. To aid interpretation, we multiplied T1 verification, change in congruence, and T2 congruence scores by (-1) so that a higher score indicated greater verification or congruence.

Dependent Variables

We collected four outcome measures at the end of the semester (T3) and grades on group projects after the semester ended. We measured *social integration* using Smith et al.'s (1994) scale. Respondents indicated the extent to which they agreed or disagreed with statements such as "Everyone's input is incorporated into most important study group decisions" on a series of scales ranging from 1 (strongly disagree) to 7 (strongly agree). The internal consistency of the scale was sufficiently high ($\alpha = .82$) that we averaged responses to the nine items in the scale. We measured *group identification* by asking participants to indicate their agreement with six statements derived from Mael and Ashforth's (1992) organizational identification scale on 7-point scales ranging from 1 (strongly disagree) to 7 (strongly agree). We modified the original items to reflect identification with the group rather than the organization (e.g., "When someone criticizes the study group, it feels like a personal insult"). The internal consistency of this scale was substantial ($\alpha = .92$), leading us to average the scores of the six items. We measured *relationship conflict* with Jehn's (1995) relationship conflict scale, asking participants to rate how much friction they perceived among members of their study group, how much personality conflicts were evident, how much tension there was among study group members, and how much relationship conflict there was among group members over the preceding four weeks on scales ranging from 1 (none) to 5 (a lot). In light of the substantial internal consistency of the four items ($\alpha = .92$), we averaged scores on this scale. To measure *task conflict*, we used Jehn's (1995) task conflict scale. Participants indicated the amount of conflict about the task itself they perceived over the preceding four weeks. Subjects rated the four items in this scale (e.g., "How much conflict about the work you do is there in your study group?") on scales of 1 (none) to 5 (a lot). We used the mean of these four items ($\alpha = .81$) as a task conflict score. For each of these four dependent variables, we averaged individuals' scores within workgroups to create group-level dependent measures. This aggregation was appropriate given that responses of participants within groups were more similar than responses of participants from different groups for each outcome measure (all F 's > 2.36 , p 's $< .0001$, intraclass correlation range = .23 to .50).

Group performance. We collected grades for 14 group projects in several different required courses. All participants took managerial economics, financial accounting, and statis-

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tics; three of the cohorts were also enrolled in operations management and marketing management, two cohorts also took organizational behavior and financial management, and the remaining two took financial management and an elective course. To strengthen the causal implications of our analyses of T2 congruence, we omitted grades on the few preliminary group assignments that were handed in before the administration of the T2 survey. We collected three or four group project grades for the teams in each cohort, except for one cohort, for which we collected two group project grades.

We operationalized creative and computational tasks by evaluating the degree to which each project called for subjective judgments that would benefit from considering divergent perspectives versus assembling and analyzing clear-cut information (Hambrick et al., 1998). For example, one group project in the organizational behavior course required study groups to devise a plan for how a specific company should go about changing its organizational culture. Because there is no quantifiable criterion for such a task, groups benefited from considering a variety of perspectives on this problem. Similarly broad analyses of business problems were critical to performance on group projects in marketing, statistics, and operations management. We accordingly averaged z-scores on group project grades from these courses to form a measure of group performance on creative tasks. In contrast, the course project in accounting emphasized quantitative analyses of various companies' financial statements, analyses for which students who possessed specialized accounting expertise could find objectively correct solutions more or less on their own. We averaged the z-scores for the two group projects in the accounting course to form a measure of group performance on computational tasks.

Control Variables

We measured or computed a number of variables that we thought might be related to group processes for use as control variables. We excluded three potential control variables—group size, mean score on the Graduate Management Admissions Test, and mean undergraduate grade-point average—after we found that they did not exhibit any significant effects or substantively change any results. Because mean age and age diversity were positively correlated, we controlled for *mean age* when testing the effects of age diversity. Age was the only diversity measure calculated from a continuous variable for which it made sense to control for the mean. We measured *team experience* by asking participants on the T1a survey how many months they had worked in a workgroup in their previous employment. Because people may learn how to work effectively in groups through experience, we controlled for group members' mean length of workgroup experience. We included six questions at T1a designed by Wageman (1995) to tap preferences for working in groups ($\alpha = .81$). Examples of *work preference* items were "I prefer tasks that allow me to work with others" and "I like my work best when I do it all myself" (reverse-scored). We controlled for group diversity in these preferences (i.e., the standard deviation divided by the mean of group members' preference scores averaged across the six items).

We also controlled for *cohort*. Only two full cohorts took organizational behavior during their first semester. Because the organizational behavior course included a module at the beginning of the semester on workgroup dynamics, we created a dummy variable set to 1 for those participants who worked in their assigned workgroup in the organizational behavior course, and 0 otherwise. We also ran the regressions with two dummy variables to indicate the three categories of courses that cohorts took together, but the additional dummy variable did not substantively change the results, so we conserved a degree of freedom by using only a single cohort dummy variable.

To ensure that congruence was not confounded with initial liking or perceived similarity, we controlled for *liking* and *perceived similarity* at T1. We asked participants on the T1b survey to rate how much they liked each person in their group and how similar they were to each person in their group on a scale of 1 (not at all) to 10 (extremely well/extremely). For each of these items, we averaged each participant's ratings of his or her group members and then calculated the mean of these individual averages within each group to derive group-level scores for liking and perceived similarity.

Mean self-view and mean appraisal. We computed a group measure of the positivity of self-views and appraisals at T1 and T2 by averaging each set of ratings across all 11 dimensions and all group members. We controlled for these two components from which congruence was derived—mean self-views and mean appraisals from the same time period as the respective congruence score—to ensure that congruence effects were not a spurious consequence of positive appraisals or self-views contributing to group effectiveness. For example, congruence could have been confounded with positive appraisals for people with positive self-views. This concern stemmed from considerable research in social psychology suggesting that people are motivated to obtain positive appraisals from their partners (e.g., Jones, 1973). Controlling for the valence of self-views and appraisals diminishes the plausibility of the notion that positivity strivings could account for interpersonal congruence effects.

Data Analysis

All analyses were conducted at the group level. We conducted separate simultaneous regression analyses on each dependent variable to test the hypotheses. We computed the interaction terms from mean-centered independent variables to reduce collinearity between the interaction terms and their component main effects (Aiken and West, 1991). Because we expected greater diversity to have a more positive effect when congruence was higher, we expected the interaction coefficients to be significantly greater than zero for social integration, group identification, and creative task performance, and significantly less than zero for relationship and task conflict.

RESULTS

The means, standard deviations, and intercorrelations among all the group-level measures are displayed in table 1.

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Table 1

Means, Standard Deviations, and Correlation Coefficients for Group-level Variables (N = 83 Groups)*											
Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Mean age	27.10	1.29									
2. Team experience	20.41	11.18	.39								
3. Work preference diversity	.20	.08	-.09	.02							
4. Cohort	.29	.46	.00	.01	.12						
5. T1 liking	7.20	.67	-.07	.00	.01	.07					
6. T1 perceived similarity	5.00	.70	-.01	-.02	-.21	.02	.53				
7. Total T1 mean self-view	7.51	.50	-.32	-.24	-.12	-.07	.16	.22			
8. Total T1 mean appraisal	7.11	.51	-.23	-.07	.24	-.18	.48	.33	.49		
9. Total T2 mean self-view	7.55	.46	-.21	-.07	-.05	-.10	.10	.09	.57	.39	
10. Total T2 mean appraisal	7.09	.51	-.16	.12	.19	-.08	.21	.16	.31	.41	.39
11. Demographic diversity	.30	.06	.01	.03	-.06	.11	-.19	-.15	-.09	-.20	-.07
12. Functional diversity	.62	.07	.07	.08	-.14	.03	-.25	-.08	-.03	-.33	-.02
13. T1 verification	-1.64	.30	-.13	-.06	-.08	-.09	.09	.33	.23	.37	.13
14. Change in congruence	-.03	.39	.05	.06	.05	.29	.03	-.13	-.10	-.29	-.16
15. T2 congruence	-1.67	.33	-.06	.01	-.01	.27	.04	.15	.10	-.01	-.08
16. Group identification	5.32	.57	-.10	.17	.08	.03	.22	.24	-.03	.06	-.13
17. Social integration	4.94	.71	-.08	.26	.24	.06	.19	.24	.09	.11	-.03
18. Relationship conflict	2.37	.78	.08	-.18	-.31	.10	-.08	-.13	.15	-.04	.20
19. Task conflict	2.78	.50	.05	.02	-.23	.33	.04	-.11	.11	-.01	.11
20. Creative task performance	.02	.86	.10	-.08	.11	-.05	-.22	-.13	-.03	-.01	-.02
21. Computational task performance	.00	.79	-.04	.13	.14	.15	-.07	.04	.04	.13	.01
Variable	10	11	12	13	14	15	16	17	18	19	20
10. Total T2 mean appraisal											
11. Demographic diversity	-.14										
12. Functional diversity	-.28	.04									
13. T1 verification	.23	-.07	-.12								
14. Change in congruence	.17	.09	-.04	-.58							
15. T2 congruence	.41	.05	-.16	.22	.67						
16. Group identification	.52	-.17	-.15	.22	.12	.35					
17. Social integration	.47	-.06	-.13	.19	.26	.48	.66				
18. Relationship conflict	-.43	.09	.17	-.08	-.27	-.40	-.53	-.79			
19. Task conflict	-.27	.14	.08	-.12	-.01	-.12	-.24	-.52	.72		
20. Creative task performance	.20	.05	-.24	.05	.03	.08	.23	.17	-.19	-.13	
21. Computational task performance	-.09	-.08	.20	-.12	.19	.11	.00	.09	-.13	-.01	-.02

*All correlations above .21 are significant at $p < .05$.

Hypothesis 1 predicted that high interpersonal congruence would attenuate the negative effect of diversity on social integration and group identification and the positive effect of diversity on relationship conflict. The equations in table 2 reveal significant interaction effects between demographic diversity and T2 congruence on social integration and between functional diversity and T2 congruence on group identification, but no significant interaction effects for relationship conflict. To interpret the form of these significant interaction effects, we split the sample at the median of T2 congruence into low-congruence groups (N = 41) and high-congruence groups (N = 42). In each subsample, we then regressed social integration on the eight control variables and demographic diversity, and we regressed group identification on the eight control variables and functional diversity. These analyses revealed that demographic diversity had a more negative effect in low-congruence groups than in high-congruence groups for social integration ($\beta = -.10$ vs. $+.15$). Similarly, functional diversity had a more negative effect in low-congruence groups than in high-congruence groups for group identification ($\beta = -.08$ vs. $+.15$). The form of these interac-

tion effects supports hypothesis 1. Hypothesis 2 was not supported, as T2 congruence did not moderate the effect of diversity on task conflict.

Hypothesis 3 predicted that under low levels of interpersonal congruence, diversity would have a negative effect on creative task performance, while under high levels of interpersonal congruence, diversity would have a positive effect on creative task performance. As shown in table 2, the interaction between T2 congruence and demographic diversity was significant for creative task performance. Supporting hypothe-

Table 2
Regression Equations Predicting the Effects of Diversity and T2 Congruence on T3 Dependent Measures and Group Performance*

Variable	Social integration	Group identification	Relationship conflict	Task conflict
Mean age	-.15	-.19 [•]	.14	.03
Team experience	.26 ^{***}	.20 [•]	-.18 [•]	.05
Work preference diversity	.21 ^{**}	.04	-.28 ^{***}	-.27 ^{**}
Cohort	-.06	-.04	.21 ^{**}	.38 ^{***}
T1 liking	.03	-.02	.05	.18
T1 perceived similarity	.21 ^{**}	.24 [•]	-.15	-.24 [•]
Total T2 mean self-view	-.28 ^{***}	-.13	.34 ^{***}	.23 [•]
Total T2 mean appraisal	.39 ^{***}	.28 ^{**}	-.33 ^{**}	-.24
Demographic diversity (DD)	.01	-.14	.03	.06
Functional diversity (FD)	.05	-.05	.00	-.02
T2 Congruence (T2C)	.30 ^{***}	.21 ^{**}	-.27 ^{***}	-.09
DD x T2C	.14 ^{**}	.09	-.06	-.02
FD x T2C	.02	.30 ^{***}	.00	-.01
Overall model F	7.09 ^{****}	4.06 ^{****}	4.94 ^{****}	2.58 ^{***}
R ²	.57	.43	.48	.33
Adjusted R ²	.49	.33	.38	.20
N (groups)	83	83	83	83

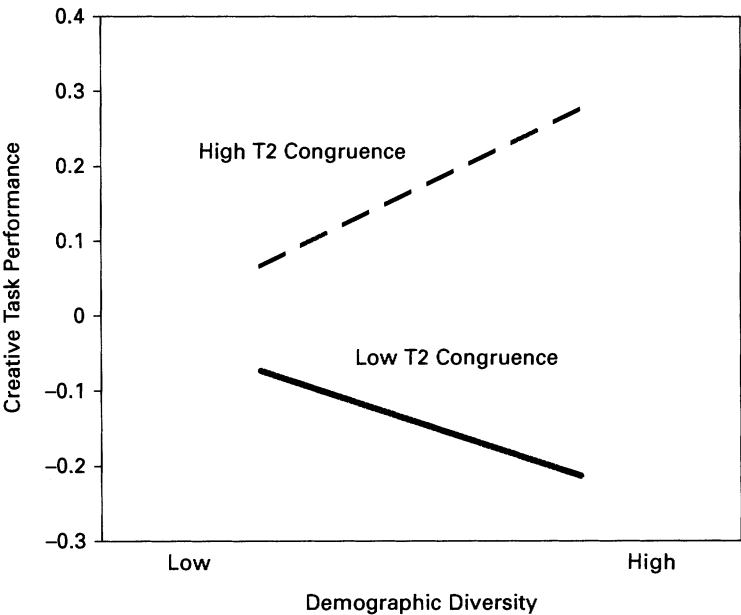
Variable	Creative task performance	Computational task performance
Mean age	.21	-.08
Team experience	-.18	.19
Work preference diversity	.06	.22 [•]
Cohort	.01	.09
T1 liking	-.24	-.12
T1 perceived similarity	-.06	.12
Total T2 mean self-view	-.10	.26 [•]
Total T2 mean appraisal	.33 [•]	-.31 [•]
Demographic diversity (DD)	.07	-.12
Functional diversity (FD)	-.23 [•]	.17
T2 Congruence (T2C)	-.05	.21
DD x T2C	.23 ^{**}	-.23 [•]
FD x T2C	-.14	-.06
Overall model F	1.71 [•]	1.81 [•]
R ²	.28	.29
Adjusted R ²	.12	.13
N (groups)	71	72

• $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$; tests of directional hypotheses are one-tailed.
* Entries represent standardized coefficients from simultaneous regression models.

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sis 3, a median split analysis revealed that demographic diversity had a negative effect in low-congruence groups and a positive effect in high-congruence groups on creative task performance ($\beta = -.12$ vs. $+.21$). This interaction is depicted in figure 1.

Figure 1. Interaction of demographic diversity and T2 congruence on creative task performance.



In addition to this predicted effect on creative task performance, we found an unexpected marginally significant interaction between T2 congruence and demographic diversity on computational task performance. Demographic diversity had a more positive effect on computational task performance in low-congruence groups ($\beta = .23$) than in high-congruence groups ($\beta = -.29$).

Given the significant interaction between T2 congruence and demographic diversity on creative task performance, we tested whether this effect was mediated by social integration, the other outcome variable on which this particular interaction effect was significant. We followed Baron and Kenny's (1986) procedure to test this relationship. The significant interaction effect on both the mediator (social integration) and the outcome variable (creative task performance) satisfied their first two criteria for establishing mediation. We proceeded to regress creative task performance on the original predictors along with the mediator variable. The significance of the interaction effect did decrease modestly from the original equation (from $\beta = .23$, $p < .05$, to $\beta = .20$, $p < .10$), but the effect of social integration on creative task performance did not reach significance ($\beta = .19$, n.s.). Therefore, this test did not fully support the prediction in hypothesis 4 that the moderating effect of T2 congruence on demographic diversity was mediated by social integration.

The building blocks of later congruence. To assess whether groups achieved a consequential level of congru-

ence only after months of working together or whether meaningful differences in congruence emerged as soon as group members began to interact, we tested the effects of the two logical building blocks of T2 congruence, initial T1 verification and the subsequent change in congruence between T1 and T2. Remarkably, the results indicated that T1 verification did systematically moderate the effect of diversity on group outcomes four months later, further supporting hypotheses 1 and 3. Table 3 reports the results of these analyses. The interaction between T1 verification and demographic diversity was significant for social integration, group identification, relationship conflict, and creative task performance. Demographic diversity interacted significantly with change in congruence on creative task performance and marginally on computational task performance. Functional diversity interacted significantly with T1 verification on creative task performance, though not in the predicted direction, and with change in congruence on group identification. The patterns underlying six of these eight interactions are consistent with hypotheses 1 and 3.

Given these significant interaction effects, we proceeded to test whether social integration, group identification, and relationship conflict, all of which were significantly affected by the interaction between T1 verification and demographic diversity, mediated the interactive effect of T1 verification and demographic diversity on creative task performance. We inserted these three potential mediators as a block into the original model predicting creative task performance. We found evidence of partial mediation, as the block of mediators together explained significant variance beyond the original model (change in $R^2 = .09$, $p < .05$), and the interaction between T1 verification and demographic diversity dropped from significance (from $\beta = .29$, $p < .05$, to $\beta = .16$, n.s.). Of the three mediators, group identification had a significant effect on creative task performance ($\beta = .32$, $p < .05$). Social integration and relationship conflict were not significant due to their correlation with group identification. These results support hypothesis 4.

Supplemental analyses. To test whether the direction of the discrepancies between self-views and appraisals mattered, we recalculated T2 congruence two times, first computing a sum of only “overestimates”—appraisals more favorable than self-views—for each target and then computing a sum for each target of only “underestimates”—appraisals less favorable than self-views. We used a sum rather than a mean because the number of dimensions (out of 11) included in this measure varied across target-perceiver pairs (depending on how many dimensions exhibited over- or underestimation), and thus the denominator used to compute the mean would have varied, rendering interpretation more difficult. We then replicated the original analyses twice, first using the measure of overestimates (incongruence in one direction) and a second time using the measure of underestimates (incongruence in the other direction). These analyses revealed that decrements in congruence in either direction impaired group functioning to about the same extent. To quantify this pattern, we statistically compared each pair of

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Table 3

Regression Equations Predicting the Effects of Diversity, T1 Verification, and Congruence Change on T3 Dependent Measures and Group Performance*

Variable	Social integration	Group identification	Relationship conflict	Task conflict
Mean age	-.19*	-.20*	.18*	.06
Team experience	.29***	.22*	-.14	.08
Work preference diversity	.33***	.13	-.31***	-.33***
Cohort	-.17*	-.11	.31***	.47***
T1 liking	.10	-.01	-.02	.12
T1 perceived similarity	.23*	.22*	-.19	-.25*
Total T1 mean self-view	-.09	-.03	.29**	.22
Total T1 mean appraisal	-.15	.00	.06	.11
Demographic diversity (DD)	-.06	-.20**	.10	.13
Functional diversity (FD)	-.02	-.06	.05	.00
T1 verification (T1V)	.44****	.32**	-.22*	-.15
Change in congruence (CC)	.58****	.40****	-.58****	-.26*
DD x T1V	.25**	.28**	-.25**	-.21
DD x CC	.08	.03	.05	.08
FD x T1V	.05	.16	-.14	.00
FD x CC	.08	.40***	-.02	-.01
Overall model F	4.77****	3.29****	4.05****	2.38***
R ²	.54	.44	.50	.37
Adjusted R ²	.42	.31	.37	.21
N (groups)	83	83	83	83

Variable	Creative task performance	Computational task performance
Mean age	.18	-.05
Team experience	-.11	.12
Work preference diversity	.14	.12
Cohort	-.04	.14
T1 liking	-.35**	-.14
T1 perceived similarity	-.05	.10
Total T1 mean self-view	.00	.02
Total T1 mean appraisal	.21	.08
Demographic diversity (DD)	.03	-.10
Functional diversity (FD)	-.21	.24*
T1 verification (T1V)	.24*	-.08
Change in congruence (CC)	.12	.13
DD x T1V	.29**	-.12
DD x CC	.29**	-.25*
FD x T1V	-.39**	-.15
FD x CC	-.05	-.22
Overall model F	1.49	1.24
R ²	.31	.27
Adjusted R ²	.10	.05
N (groups)	71	72

* $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$; tests of directional hypotheses are one-tailed.

* Entries represent standardized coefficients from simultaneous regression models.

two coefficients testing the identical effect (e.g., the interaction between congruence and demographic diversity on social integration) from the separate equations (over- and underestimate measure of congruence) using a Wald test of difference between coefficients (Greene, 1997). Of the significant main effects and interactions involving T2 congruence,

none of these pairs of coefficients differed significantly across the two equations. Moreover, the main effect coefficients for the two directional congruence measures were always identical in sign for each dependent variable, and these were always the same sign as the corresponding coefficients in table 2. These results indicate that the effects of interpersonal congruence were not an artifact of incongruence in one particular direction.³

Our final question was whether more diverse groups had more difficulty achieving congruence. To test this, we regressed T1 verification and T2 congruence on the two types of diversity and perceived similarity (along with the other control variables). Functional diversity had a marginally significant negative effect on T2 congruence ($\beta = -.21, p < .10$), while perceived similarity at T1 had a positive effect on T1 verification ($\beta = .33, p < .05$).

DISCUSSION

Our results suggest that interpersonal congruence moderates the impact of diversity on group processes and performance. Most provocatively, in groups that achieved high interpersonal congruence, demographic diversity enhanced creative task performance; in contrast, in groups that failed to achieve interpersonal congruence, diversity impaired performance. In short, when it comes to transforming the value of diversity into high performance, a modicum of interpersonal congruence appears to be highly effective.

Interpersonal congruence moderated the effect of diversity on important dimensions of group functioning other than performance. Mid-semester congruence moderated both the effect of demographic diversity on social integration and the effect of functional diversity on group identification. The deleterious effects of diversity seen in groups with low interpersonal congruence tended to occur less in groups with high congruence. While the effects of congruence that emerged after several weeks were noteworthy, it was particularly remarkable that verification that emerged after a mere ten minutes of interaction was consequential. For example, initial verification moderated the effect of demographic diversity on social integration, group identification, relationship conflict, and creative task performance. The effects of initial verification strengthen our causal claims by eliminating any possibility that performance caused identity negotiation processes rather than the other way around (Hackman, 1987; Wageman, 1999). Change in congruence over the first half of the semester moderated the relationship between demographic diversity and creative task performance and the relationship between functional diversity and group identification. These interaction effects were driven by a tendency for diversity to have negative effects when congruence was low but not when it was high.

The effect of demographic diversity on creative task performance was moderated by initial verification, change in congruence, and later congruence. Only the moderating effect of initial verification, however, was partially mediated by the group-process variables of social integration, group identification, and relationship conflict. Thus, interpersonal congruence

3

We also constructed a "social desirability index" of the extent to which teammates' appraisals of participants were more flattering than participants' own self-views. A response for which the appraisal was more positive than the self-view received a +1, a response in which the two ratings were equal received a zero, and a response for which the appraisal was less positive than the self-view received a -1. We coded each pair of appraisals and self-views according to this scheme and then aggregated across dimensions, perceivers, and targets within each group to assign each group a score on this index. We then included this social desirability index as a control in our multiple regression models and tested its interaction with congruence to determine whether it moderated the effect of congruence. Examining the effects of T2 congruence, social desirability was a significant predictor for only one of the six outcome variables, relationship conflict. More importantly, including the social desirability index did not cause any significant effects involving interpersonal congruence to drop from significance. In our multiple regression models examining the effects of T1 congruence and change in congruence, social desirability was not a significant predictor for any of the six outcome variables. In these models, the interaction between congruence and social desirability was significant only for social integration, but again, the inclusion of these variables did not cause any significant findings involving interpersonal congruence to drop from significance. We concluded that our results were not an artifact of social desirability.

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affected creative task performance both directly, via its interaction with demographic diversity, and through the group-process variables that partially mediated this effect. We would also expect interpersonal congruence and these group-process indicators to influence unmeasured facets of effectiveness, such as individual members' well-being and the group's ability to improve over time (Hackman, 1987).

Interpersonal Congruence as a Property of Groups

The amount of congruence achieved by a particular target was significantly related to the individual congruence levels of the target's group members. In fact, the group effect was as strong after ten minutes as it was after nine weeks (intra-class correlation = .14 at both T1 and T2). But what happened during those first ten minutes for individual verification to be systematically higher in some groups than in others? Apparently, targets were more successful in bringing perceivers' appraisals into line with their self-views—i.e., eliciting self-verification—in some groups than in others. Because group members were randomly assigned to groups, systematic differences across groups in perceptiveness or perspective-taking ability (Galinsky and Moskowitz, 2000) are unlikely to explain differences in initial verification. The most plausible remaining explanation is that targets communicated more information about their self-views in some groups than in others.

What would account for such striking between-group differences in the amount of diagnostic personal information revealed by targets after such a brief introductory period? In a new work environment imbued with strong norms toward conformity, some participants were undoubtedly reluctant to risk disclosing unique personal information that would facilitate self-verification (e.g., information about one's strengths, weaknesses, and unique qualities). Sharing personal information might seem less threatening, however, after others in the group have already disclosed personal information about themselves. If group members appear to be supportive of those who first disclose personal information, and this fosters a belief that the team is safe for interpersonal risk taking, such psychological safety (Edmondson, 1999) may create a positive spiral of revelatory information sharing. Moreover, norms of reciprocity might make members more likely to disclose personal information once others in the group openly communicate their own individuating information (Dindia, Fitzpatrick, and Kenny, 1997). Of course, if no one in the group initiates such open dialogue, the unbroken pressure to conform may discourage members from revealing unique information. The presence of a self-disclosing "trigger" in the group may thus explain why some groups achieved high levels of congruence after only ten minutes of interaction but other groups did not.

The effects of initial verification are particularly compelling in light of the brief interval we gave participants to form initial appraisals. At first blush, it might seem that group members would require substantial interaction to achieve a sufficient level of verification to benefit group functioning. After all, multiple attempts at conveying self-relevant information

might be necessary to shape the appraisals of other group members, especially since group settings divide each perceiver's attention among several targets. Moreover, despite targets' motivation to bring others' appraisals in line with their own self-views, it may take time to achieve enough psychological safety in a group to overcome the risks associated with self-disclosure. This seems especially likely in work contexts that reward competence and favor people with positive reputations. Our results refute these intuitions, however, causing one to ask how quickly group members might achieve enough verification to benefit group functioning. Considerable evidence suggests that the identity negotiation process may sometimes unfold very rapidly, raising the possibility that verification may develop very early in relationships. Even brief glimpses of expressive behavior can reveal a wealth of information about targets through facial expressions, movements, gestures, and other nonverbal behavior (Albright, Kenny, and Malloy, 1988). And researchers have found that impressions based on observing a photo or meeting someone for a brief period are often surprisingly congruent with targets' self-views (Watson, 1989; Ambady and Rosenthal, 1992, 1993; Kenny et al., 1992). This suggests that the very first moments when group members encounter each other might set the tone for subsequent group processes by determining whether levels of interpersonal congruence will be high or low.

Self-Verification and Self-Categorization Theory

Our emphasis on the self-verification processes that give rise to interpersonal congruence contrasts sharply with the thrust of self-categorization theory, the most prevalent approach to solving difficulties associated with diversity. Self-categorization and self-verification approaches both assume that people are motivated to minimize subjective uncertainty about "one's self-concept and place within the social world" (Hogg and Terry, 2000: 124; Swann, Rentfrow, and Guinn, 2002). The mechanisms they propose for minimizing uncertainty are very different, however. The sharpest distinction concerns the standing of the self relative to the group. According to self-categorization theory, "targets are no longer represented as unique individuals but, rather, as embodiments of the relevant prototype—a process of depersonalization" (Hogg and Terry, 2000: 123). In contrast, the self-verification approach requires neither the existence of a prototypical group member nor cognitive assimilation of the self to this prototype. Indeed, self-verification does not require people's self-views to conform to any parameters whatsoever. Members of a group with maximally diverse self-views can receive high levels of self-verification so long as others' appraisals match people's self-views. Because verification requires no shift in self-conception to render its benefits to the group, members can accentuate their unique attributes.

These divergent conceptions of the interplay between the self and group reflect different assumptions about the type of feedback people desire. Self-categorization theory assumes that people are motivated to acquire self-enhancing positive feedback (Hogg and Terry, 2000), whereas our approach is predicated on a desire for self-verifying feedback, even if

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such feedback is negative. Although we did not test these assumptions in our study, they have implications for the accuracy of group members' appraisals of each other. If group members view themselves as having some negative attribute or lack of ability, the verification approach suggests they will be more comfortable among group members who come to know and understand these qualities than among those who entertain unsubstantiated positive appraisals. Such an understanding of each other's weaknesses may help group members play to their strengths in contributing to group work.

Methodological Limitations

The methodological approach we employed has several strengths and, like any single study, some limitations. Our causal claims are strengthened by the study's longitudinal design, which reduces problems of reciprocal causality inherent in cross-sectional designs (Hackman, 1987). Our control over the timing of the initial surveys relative to group members' introductions allowed us to reduce random variation in the results while capturing very early verification, a rare opportunity for non-experimental groups. Moreover, we included numerous control variables to reduce the plausibility of alternative explanations for our results, including liking, perceived similarity, participants' team experience, cohort, mean age, and initial work preferences. None of these variables qualified our results. Nevertheless, because we measured rather than manipulated our key variables, some omitted variable may have been responsible for scores on both the predictor and criterion variables.

Although we measured self-views and appraisals along dimensions shown in pilot tests to be important to people in this population, we did not measure how much each participant in our sample valued each dimension or how much tolerance he or she had for those with different evaluations. Moreover, some participants may have valued dimensions other than those we measured, including some that directly mapped onto particular diversity dimensions. For example, self-views and appraisals of expertise in marketing or finance may have played an active and even explicit role in some groups' deliberations. Capturing such variation in the value people place on a variety of different dimensions may have strengthened the effects of interpersonal congruence even further. Finally, although our participants were adults working together on projects that affected their course grades and subsequent career options, the academic tasks and environment raise questions about the generalizability of our results to other samples and contexts. These and related questions are left to future research to answer.

Implications

Although any group has the potential to verify members' self-views, our results underscore the fact that not all groups do so. Researchers should search for factors that compel group members to form congruent, self-verifying appraisals, especially during initial group interaction. For example, group leaders may encourage members to give honest feedback about

their perceptions of others' task-relevant abilities and characteristics and disclose their own task-relevant self-views. Of course, such openness may reveal differences of opinion that are irreconcilable or evoke defensive behavior that alienates some members of the group. Moreover, some self-views (e.g., lazy, greedy) could hurt the group if verified. Nevertheless, our research suggests that insofar as problems in the group are caused by differences in members' perceptions of each other, the potential benefits of illuminating interpersonal perceptions may be worth these risks. Researchers could employ a variety of methodologies to study perceptions and behavior during the initial phases of group interaction, the stage of group development that promises to reveal the most insight into identity negotiation processes. Even if some group members are previously acquainted, identity-related events that occur early in the life of the newly assembled group will set the stage for future interaction and performance.

From such early interactions a group norm might emerge to value those who draw on their unique experiences to produce novel ideas, fostering continued self-disclosure and respect for idiosyncratic qualities that contribute to the group. Such a norm could be especially potent if members utilize their differences to achieve the shared objectives that presumably brought group members together in the first place. Consistent with Ely and Thomas' (2001) integration-and-learning perspective, we propose that group members may be able to simultaneously verify each other's unique characteristics—the process that lies at the heart of interpersonal congruence—and use them to achieve their shared objectives and mutual interests.

Conclusion

The effects of diversity on group functioning are notoriously difficult to predict because they depend on so many factors, including, for example, the particular mix of diversity dimensions present in the group, the way the group's tasks and broader context shape the salience of various diversity dimensions, and the extent to which the particular members of the group hold and use stereotypes associated with categorical diversity dimensions. Add to these complexities the fact that every group member belongs to a multitude of social categories and possesses a wealth of idiosyncratic personal characteristics, and it is no surprise that the results of diversity research are so equivocal.

In contrast, the interpersonal congruence approach circumvents the need to guess how numerous social category memberships will play out for specific individuals in particular groups and contexts. It does this by recognizing that social category memberships influence interaction only insofar as they shape group members' self-views and appraisals of each other. By considering these self-views, appraisals, and the congruence between them directly, many dimensions of diversity are captured in a small set of specific concepts that parsimoniously predict and explain the functioning of diverse groups. Moreover, the benefits stemming from self-verification do not require any externally generated interventions or

any preexisting conditions. Members of any group, however diverse or whatever their circumstances, have the capacity to verify one another's self-views and, as a result, fully capitalize on their diversity.

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