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**Making the Most of Diversity: How Collectivism Mutes the Disruptive Effects of Demographic
Heterogeneity on Group Performance**

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January 28, 2015

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Heterogeneity on Group Performance**

ABSTRACT

We advance social identity theory by hypothesizing that the content of demographic attributes on which members differ, and not just their distribution, influences the relationship between a group's composition and its performance. We test this theoretical logic, using both laboratory and field data, by investigating groups with different distributions of members (from the same or different nations) and cultural orientations (individualistic or collectivistic). We hypothesize that, because a collectivistic orientation promotes group identification, a focus on collective goals, and a sense of being an interchangeable exemplar of the group, it also reduces the polarizing effects of demographic heterogeneity and improves group performance. Using an experimental design, we find that subjects primed with a collectivistic rather than an individualistic orientation see less distinction between nationally homogeneous and heterogeneous groups, and expect the group to be more successful. We also analyze archival data representing 5,460 Himalayan climbing expeditions and find that expeditions characterized by higher levels of national heterogeneity are more likely to reach the summit if more members hail from collectivistic rather than individualistic countries. Simultaneously considering the distribution and content of attributes on which members differ will accelerate the evolution of a comprehensive theory of social identity processes and consequences.

As organizations increasingly rely on multinational teams, researchers have investigated how work groups' national composition influences their performance (e.g., Earley & Gibson, 2002; Joshi & Roh, 2009). National culture is a system of values, norms, standard operating procedures, unstated assumptions, tools, and habits that are shared among a group of people (Hill, 1997; Triandis & Suh, 2002: 16). Cultural orientation is a fundamental aspect of a person's identity because it is in force "from birth," is readily detectable, and influences how people interact, share information, and define and solve problems (e.g., Gibson & Gibbs, 2006).

Organizational researchers have emphasized a distributional approach to understanding group demography at work (Pfeffer, 1983). Often conceptualized using social identity theory (e.g., Chattopadhyay, Tluchowska, & George, 2004), the demography approach focuses on how the distribution of various attributes—such as nationality, gender, race, experience, tenure, and functional expertise—affect group processes and outcomes (e.g., Chua, 2013). Some research has shown that homogeneous groups, in which members share demographic attributes, establish greater cohesion and perform more effectively on a variety of tasks because they avoid the conflict, discomfort, and process losses that often arise in demographically heterogeneous groups (e.g., O'Reilly, Caldwell, & Barnett, 1989; Joshi, Liao, & Roh, 2011). In contrast, other research has shown that diverse groups are more likely to contain a wider range of knowledge, skills, and abilities, due in part to members' differing opinions and perspectives (van Knippenberg, De Dreu, & Homan, 2004: 1009). This informational diversity enables groups to generate more creative ideas and provide more innovative solutions (e.g., De Dreu & West, 2001).

To resolve these contradictory views, researchers have distinguished between surface and deep level diversity (Harrison, Price, & Bell, 1998), and focused on the factors that cause task-relevant information and perspectives to emerge in group settings (van Knippenberg et al., 2004).

These approaches have helped illuminate the relationship between a group's demographic composition and its performance. Most scholars believe, however, that organizational research has yet to definitively link demographic differences to group effectiveness, including specific aspects of group processes such as performance, conflict, cooperation, and members' commitment to the group or organization (e.g., Joshi & Roh, 2009; van Dijk, van Engen, & van Knippenberg, 2012; see Williams & O'Reilly, 1998 for a review). Thus, despite significant research, the answer to the central question of how a group's demographic diversity, and particularly its national heterogeneity, influences its performance remains elusive.

We suggest that clarifying the diversity-performance relationship requires accounting for both the presence of diversity—that is, a task group's distributional heterogeneity—and the content of the attributes on which group members differ. This combined approach is important because different demographic attributes may be associated with differences in norms, values, and beliefs that can, in turn, influence how diversity is experienced in the group. For example, a group of people from diverse national backgrounds might be more cooperative if, despite their diversity, they all come from collectivistic rather than individualistic national orientations, whereas those differences might be accentuated if individualism is more salient. Thus, instead of focusing on the mere presence of diversity, advancing our understanding of diversity requires “contextualizing” team diversity dynamics, or clarifying how different demographic attributes influence groups with particular identities (Jackson & Joshi, 2011: 675).

Differences in nationality may be an ideal starting point for this type of analysis because a vast cross-cultural literature has explored fundamental distinctions between cultures with respect to norms, values, and beliefs (e.g., Gelfand et al., 2011). Further, results from one study hint at the value of employing a combined approach to understanding diversity. Specifically, Van der

Vegt and his colleagues (2005) found that tenure and functional heterogeneity were positively associated with innovative group climates in low power-distance national cultures, but negatively associated with such innovative climates in high power-distance cultures. Though not frequently examined, interactions in which demographic distributions are related to outcomes depending on the group's national culture orientation may be prevalent and may advance our understanding of how diversity is experienced within groups and how it influences performance.

Our goal in this paper is to develop a more comprehensive understanding of how the content of task group members' national cultures (individualistic or collectivistic) influences the relationship between distributional heterogeneity, defined here as the extent to which group members hail from the same or different nations, and task performance. We draw from social identity theory (e.g., Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) to argue that the substantive emphasis of a group's national orientation will set the stage for how group members respond to the distribution of demographic differences.

We focus on national culture because of how fundamentally it influences group identification and relational behavior (e.g., Morris, Podolny, & Sullivan, 2008). More precisely, we examine the individualism-collectivism dimension of culture: first, because it represents one of the most essential distinctions between societies (e.g., Triandis, 2001), and second, because, as we suggest below, it influences the salience of demographic categories among group members. This latter feature of collectivism is crucial in group settings because it affects members' identification with their group—that is, whether personal attributes dominate, differentiating each member from one another or, instead, whether shared attributes are most salient and increase perceptions of similarity among group members (Turner, Oakes, Haslam, & McGarty, 1994). The relative salience of personal versus group-level attributes affects whether members view themselves as

interchangeable exemplars of a cohesive in-group, and as such, their willingness to adhere to group-level norms and values and pursue group goals (e.g., Hogg & Terry, 2000). Thus, we suggest that collectivism may function to mute otherwise salient differences within nationally heterogeneous groups, and in so doing, elevate group performance.

We advance theory by illustrating why it is essential to incorporate the content of demographic attributes into analyses of demographic heterogeneity and group performance. We first develop our hypotheses and then discuss the research context, data, and analyses conducted for two studies, one an experimental scenario of firefighting teams and the other an archival study of Himalayan mountain climbing expeditions. We conclude with a discussion of the theoretical contributions and potential generalizability of the research to work settings and other demographic attributes.

THEORY AND HYPOTHESES

Social Identity Theory and Demographic Heterogeneity

Social identity theory argues that people define their self-concept in terms of membership in social groups, and that self-concepts are activated and provoke specific behaviors depending on the characteristics of others who are present in a situation (e.g., Markus & Cross, 1990). Social identity theory has two primary tenets. First, people are generally motivated to identify with groups as it enables them to maintain a positive self-concept by elevating the value and distinctiveness of their in-group versus relevant out-groups (Tajfel & Turner, 1986). Second, when members hold a common social identity in the group, they perceive themselves as similar to other in-group members, or as “interchangeable exemplars” of the group (Turner et al., 1987).

Researchers have used social identity theory to understand which of a person’s multiple identities will become salient in task group settings and how members’ diversity influences task

group processes and outcomes (e.g., Chatman, Barsade, Polzer, & Neale, 1998). Categorization processes underlie members' identification with a group and occur automatically based on ascribed visible characteristics on which members of a group vary (e.g., Allport, 1954; Mendoza, Gollwitzer, & Amodio, 2010). Members of demographically heterogeneous groups are more likely to categorize one another in terms of easily accessible demographic characteristics than are members of homogeneous groups (Chatman & Flynn, 2001). In other words, demographic categories such as nationality become salient when demographic attributes vary within a group.

Within task groups, the propensity to categorize based on the most accessible categories on which people vary is problematic because easily accessible attributes may not be the categories that are most useful for engaging in effective group process, solving the group's pressing problems, or accomplishing the group's objectives. This problem is exacerbated by the principle of functional antagonism, which suggests that as one category becomes more salient, others necessarily become less salient (e.g., Turner et al., 1994). Thus, if easily accessible, personally differentiating categories such as demographic differences are salient, other potentially task-conducive attributes, such as the group's superordinate goals, are less likely to become salient. When immutable demographic categories are salient in diverse groups, people are more likely to focus on their differences than on their similarities, making them less likely to acknowledge and act in accordance with the factors that unite them (Chatman et al., 1998).

How Collectivism Mutes Perceptions of Demographic Heterogeneity

One factor that may mitigate the automatic salience and disruptive effects of demographic categorization in heterogeneous groups is whether the group has a collectivistic or individualistic cultural orientation. Cross-cultural researchers view the individualism-collectivism distinction as fundamental to how societies operate and have studied it extensively (Zhou & Shi, 2011).

Numerous behavioral tendencies are associated with membership in individualistic versus collectivistic cultures (e.g., Triandis & Gelfand, 1998). One primary difference between a collectivistic and an individualistic orientation is the extent to which people consider themselves to be defined by or connected to the group—that is, interdependent—or, in contrast, if they identify as individualistic or independent (e.g., Morris & Peng, 1994). Individualistic cultures stress the fulfillment of individual desires over group solidarity (Fiske, Kitayama, Markus, & Nisbett, 1998), so members of these cultures may be encouraged to resist social pressure if it contradicts their own values and preferences (Goncalo & Staw, 2006). In contrast, people from collectivistic cultures would consider the failure to yield to others as counter-normative and even rude or inconsiderate.

Collectivists are more focused on communal goals (e.g., Dierdorff, Bell, & Belohlav, 2011). When group goals are salient, demographic differences such as nationality are likely to be less salient. Consistent with this perspective, Meyer et al.'s 2002 meta-analysis showed that collectivism was positively associated with members' normative commitment to their group, while individualism was negatively associated with commitment. Further, Chatman et al. (1998) drew on the concept of functional antagonism to demonstrate that making collectivistic norms salient strengthened group members' sense that they shared a common task-group identity and fate, while demographic differences became less salient. This occurs because a collective orientation causes members to attend to similarities and shared goals, and to deemphasize apparent differences (e.g., Sherif, Harvey, White, Hood, & Sherif, 1961). Once considered similar, members of a salient in-group are more likely to see similarities as relevant, trivialize differences among them, and cooperate with other in-group members (e.g., Gaertner & Dovidio, 2000).

Thus, we suggest that by increasing the salience of in-group membership through a collectivistic orientation, members of nationally diverse groups will depersonalize the self and enhance the value they place on group membership. As a result, members will be more likely to view themselves as interchangeable exemplars of a highly valued social category: their task group (Turner, 1985). Therefore we predict that, compared to an individualistic orientation, a collectivistic orientation will increase the extent to which nationally diverse members are viewed as more similar. More formally,

Hypothesis 1: The relationship between group composition and perceived similarity will be moderated by collectivism such that collectivistic observers will view members of nationally heterogeneous groups as significantly more similar than will individualistic observers.

How Collectivism Influences the Relationship Between National Heterogeneity and Group Performance

National heterogeneity can be disruptive for task group members. For example, in their classic essay on the promise and perils of multinational groups, Hambrick and his colleagues describe how different nationalities exhibit significant variation in demeanor, including “eye contact, punctuality, conversational style, interruption patterns, physiological reactions to emotional stimuli, and other types of behavior that have been associated with nationality...” (Hambrick, Davison, Snell, & Snow, 1998: 186). Disagreements about the appropriateness of such behaviors can produce affective conflict (e.g., Milliken & Martins, 1996), which is negatively related to performance (De Dreu & Weingart, 2003). Additionally, differences in conversational style can negatively affect nationally diverse groups, particularly since performance on complex tasks requires efficient communication (Gibson & Gibbs, 2006). Thus, although nationally diverse groups may, in theory, have access to more varied information that

can help with complex problems (Watson, Kumar, & Michaelsen, 1993), they are fraught with difficulties as a result of members' different worldviews. These conflicting views can hinder group performance based on members' propensity to stereotype one another (Paulus, 2000), as well as an inability to reach agreement, leverage information, or make decisions supporting collective action (e.g., Phillips & Loyd, 2006). For example, Gibson and Vermeulen (2003) found a negative relationship between demographic heterogeneity and team learning behaviors.

We suggest that the social identity processes engendered by a collectivistic cultural orientation can mitigate the otherwise disruptive effects of national heterogeneity. We also suggest that the resulting group behaviors, such as strong normative commitment (Meyer et al., 2002), a drive toward consensus (Goncalo & Staw, 2006), and a sense of a shared fate (Chatman et al., 1998), will be positively related to the group's goal achievement. In contrast, groups with an individualistic focus will not differ in their outcomes regardless of their national differences.

These performance differences arise from the fact that when groups are engaged in complex, interdependent, or risky tasks, increasing the salience of attributes that lead to categorizing task group members as part of the in-group can boost norm adherence, cooperation, and identification with superordinate goals, as well as increase commitment and group cohesion (e.g., O'Reilly et al., 1989) and reduce conflict (De Dreu & Weingart, 2003), factors that often enhance group performance (e.g., Ellemers, De Gilder, & Haslam, 2004; van Knippenberg, 2000). For example, Chatman and Flynn (2001) showed that when collectivistic goals were salient, groups were more likely to exhibit cooperative behavior that boosted performance over time.

Other evidence suggests that diverse groups only benefit from diversity if members are able to access the distinct knowledge retained by members (e.g., Hinsz, Tindale, & Vollrath, 1997) and to avoid biases which could prevent them from being able to incorporate ideas that culturally

diverse members generate. Indeed, informational differences are more likely to persist when out-group categorization processes are operating. In this case, out-group members who fail to identify with the rest of the group are unlikely to contribute the full extent of their knowledge (e.g., Homan & van Knippenberg, 2003). Taken together, we predict that nationally diverse groups that emphasize collectivism will perform better than diverse groups that emphasize individualism. More formally,

Hypothesis 2: Collectivism will moderate the relationship between national heterogeneity and performance such that nationally diverse task groups will perform better when collectivism rather than individualism is salient or prevalent.

Finally, we integrate the arguments underlying hypotheses 1 and 2, and predict that the psychological basis for enhanced performance in nationally diverse groups is that a collectivistic orientation, rather than an individualistic one, will lead to perceptions that diverse members are more similar to, and less different from, one another. Specifically, we hypothesize that task group performance will be enhanced in nationally heterogeneous groups when members view one another as more similar, since perceptions of similarity will increase members' orientation toward group goals rather than their own individual goals. Therefore, we predict that,

Hypothesis 3: In nationally heterogeneous groups, perceptions of members' similarity will mediate the relationship between the salience of collectivism and performance.

We conducted two studies to test our hypotheses. Study 1 examines all three hypotheses in an experimental scenario. Study 2 tests hypothesis 2 in the externally valid setting of Himalayan mountain climbing.

STUDY 1: METHOD

Procedure, Data, and Sample

We investigated the relationship between national heterogeneity, cultural orientation, and group performance by conducting an online scenario study of firefighting teams using a 2 (collectivistic or individualistic cultural orientation) by 2 (national heterogeneity or homogeneity) design. We solicited 319 subjects from Amazon Mechanical Turk. Subjects were required to be over 18 years of age, male (96% of firefighters are male – *Occupational Health & Safety Magazine*, 2008), U.S.-based, employed full-time, college-educated, and speak English as their first language. Subjects averaged 34 years old ($\bar{x} = 33.7$, $s.d. = 12.4$), with 11 years of work experience ($\bar{x} = 11.0$, $s.d. = 7.5$). Eighty-two percent of respondents were White, six percent were Asian, four percent were Black, and 12% categorized themselves as “other.” Seventy-nine percent of respondents had a bachelor’s degree, 17% had a master’s degree, and four percent had a doctorate or professional degree. Two-thirds of participants’ current work role was either as an individual contributor (13%) or team member (52%), and 95% worked within an organization, while 5% were self-employed. The study took 10-15 minutes to complete, and subjects who qualified and completed the entire study were paid \$1.

After answering questions regarding their background, subjects were randomly assigned to either the individualistic or collectivistic culture condition. Following Goncalo and Staw’s (2006) procedure, subjects in the individualistic condition were asked to write three statements describing something unique about themselves and why it is advantageous to “stand out from other people,” while those in the collectivistic condition wrote about groups to which they belong and why it would be advantageous to “blend in with a group.” This procedure relies on the psychological logic that human judgment is partially determined by information that is salient or top-of-mind at the moment a decision is made (e.g., Higgins, 1996), and is commonly used in cultural priming of individualism as personal independence and collectivism as

obligation vis-à-vis a relevant in-group (Oyserman & Lee, 2010). Research has shown that techniques to prime individualism and collectivism are consistent with non-experimental cross-cultural research (Oyserman, Coon, & Kemmelmeier, 2002).

Subjects then read a scenario about a team of firefighters battling a wildfire on the California-Mexico border. The scenario described an actual initiative launched by California and Mexico to coordinate responses to wildfires along their shared border. The scenario described the national composition of the team fighting the current wildfire. Without allowing subjects to look back at the cultural make-up of the team members described in the scenario, we asked them to report their perceptions of team members' similarity, and to predict the performance of that specific team of firefighters. All teams comprised five members, and firefighters varied on whether they were from the U.S. or Mexico. For national origin, teams were either homogeneous (five Mexican firefighters) or heterogeneous (four Mexican and one American firefighter).

Dependent Variables

Task group members' similarity. After reading the scenario, subjects were asked, "How similar to each other do you think the members of the team are?" Response options were based on a Likert scale, ranging from 1 = Very dissimilar, to 7 = Very similar ($\bar{x} = 5.64$, $s.d. = 0.92$).

Task group performance. Subjects were asked, "How likely do you think it is that this team of firefighters was able to extinguish the wildfire?" Response options were based on a Likert scale, ranging from 1 = Very unlikely, to 7 = Very likely ($\bar{x} = 6.04$, $s.d. = 0.88$).

Independent Variables

Group Collectivism. Subject were administered either the collectivistic or individualistic prime (0 = individualistic, 1 = collectivistic).

National Heterogeneity. Subjects were asked to report on a firefighting team that included members from either the same or from different nations (0 = all firefighters are from the same nation, 1 = firefighters are from two different nations).

STUDY 1: RESULTS

We conducted a 2 x 2 ANOVA and present results in Table 1 and Figures 1-3. Members of nationally homogeneous groups were perceived as more similar ($F(1,317) = 5.96, p < .01$), while no main effect emerged for collectivism ($F(1,317) = 1.36, n.s.$). As predicted in hypothesis 1, the interaction between national heterogeneity and collectivism was significant ($F(1,317) = 6.50, p < .01$). Subjects primed to be individualistic perceived firefighters to be significantly more similar to one another when the team was homogeneous ($\bar{x} = 5.94, s.d. = 0.81$) than when it was heterogeneous ($\bar{x} = 5.24, s.d. = 1.05; F(1,165) = 13.36, p < .01$), whereas subjects primed to be collectivistic perceived firefighters to be equivalently similar regardless of whether the team was homogeneous ($\bar{x} = 5.61, s.d. = 0.92$) or heterogeneous ($\bar{x} = 5.81, s.d. = 0.68; F(1,150) = 2.32, n.s.$). Together, these findings suggest that individualistic subjects were more attentive to differences in nationality than collectivistic subjects were. Further, for nationally homogeneous teams, subjects primed with individualism perceived members of the team to be significantly more similar to each other ($\bar{x} = 5.94, s.d. = 0.81$) than did subjects in the collectivism condition ($\bar{x} = 5.61, s.d. = 0.92; F(1,154) = 5.74, p < .05$), while for heterogeneous teams, subjects in the individualism condition perceived members of the team to be less similar to each other ($\bar{x} = 5.24, s.d. = 1.05$) than did subjects in the collectivism condition ($\bar{x} = 5.81, s.d. = 0.68; F(1,161) = 6.58, p < .01$). Thus, a collectivistic orientation muted perceived differences between nationally homogeneous and heterogeneous teams, supporting hypothesis 1.

Insert Table 1 and Figures 1-3 About Here

We conducted a 2 x 2 ANOVA to assess firefighting teams' projected likelihood of putting out the fire, our experimental measure of performance. Table 1 shows that neither main effect was significant, but as predicted in hypothesis 2, the interaction between national heterogeneity and collectivism was significant ($F(1,317) = 7.36, p < .01$). Figure 2 displays the form of the interaction. In testing hypothesis 2, that subjects primed with collectivism will expect heterogeneous teams to be more successful than will subjects primed with individualism, we found that subjects in the individualism condition expected heterogeneous teams to be less likely to succeed ($\bar{x} = 5.66, s.d. = 0.93$) than did subjects in the collectivism condition ($\bar{x} = 6.31, s.d. = 0.69; F(1,161) = 5.06, p < .05$). In contrast, subjects in the individualism condition were no more or less likely to project success for homogeneous teams ($\bar{x} = 6.26, s.d. = 0.86$) than were subjects in the collectivism condition ($\bar{x} = 6.07, s.d. = 0.86; F(1,154) = 2.83, n.s.$). Thus, a collectivistic orientation muted the projected success "penalty" that an individualistic orientation would have otherwise imposed on heterogeneous teams.

To test hypothesis 3, that perceptions of members' similarity in nationally diverse teams will mediate the relationship between the salience of collectivism and performance such that the direct effect of collectivism will weaken after perceptions of members' national similarity are considered, we conducted a mediation analysis (Baron & Kenny, 1986). We first found that heterogeneous-collectivist teams (independent variable) were positively related to perceived similarity (mediator), $\beta = 0.57, p < .001$. Second, heterogeneous-collectivist teams (independent variable) were positively related to projected success (dependent variable), $\beta = 0.65, p < .001$. Third, perceived similarity (mediator) was positively related to projected success (dependent variable), $\beta = 0.38, p < .001$. Finally, when the independent variable and the mediator were entered into the equation together, the coefficient for the independent variable 'heterogeneous-

collectivist' declined in significance ($\beta = 0.40, p < .10$), while the coefficient for the mediator 'similarity' remained highly significant ($\beta = 0.43, p < .001$). The Sobel test further confirmed that perceived similarity partially mediated the relationship between heterogeneous-collectivists and projected success ($Z = 3.47, p < .001$) for heterogeneous teams, supporting hypothesis 3. In viewing members of the team as more similar to each other, and thereby decreasing the salience of individual differences, collectivistic-primed subjects projected heterogeneous teams to be more likely to succeed at a group task.

Additional Analysis: Distinguishing Perceptions of Similarity from Group Cohesion

Research has suggested that perceptions of group members' similarity may be conflated with perceptions of a group's cohesion (e.g., Chatman & O'Reilly, 2004), so we examined the discriminant validity of our similarity construct. We solicited 109 additional subjects from Mechanical Turk with the same qualifications and, using the same scenario (fighting a wildfire), we asked them how *cohesive* they thought the team was ($\bar{x} = 5.94, s.d. = 1.03$), rather than how similar members were. Unlike study 1 findings, subjects primed with individualism did not perceive a difference in cohesion between homogeneous teams and heterogeneous teams (homogeneous: $\bar{x} = 6.06, s.d. = 1.17$; heterogeneous: $\bar{x} = 5.72, s.d. = 1.12; t = 1.46, n.s.$) nor did subjects primed to be collectivistic (homogeneous: $\bar{x} = 6.20, s.d. = 1.06$; heterogeneous: $\bar{x} = 5.89, s.d. = 1.01; t = 1.34, n.s., n.s.$), so cohesion did not mediate the relationship between heterogeneity-collectivism and success (Sobel test: $Z = 0.08, n.s.$). This suggests that perceptions of groups' cohesion are distinct from perceptions of members' similarity.

Study 1 Discussion

Study 1 showed that, when subjects were primed to be individualistic, they viewed members of nationally heterogeneous teams to be significantly less similar to each other than members of

homogeneous teams—that is, they were more attentive to differences within the group. In contrast, when subjects were primed to be collectivistic, they did not perceive a difference in similarity among members of nationally homogeneous and heterogeneous teams. The collectivistic orientation muted the differences between the two groups' compositions, whereas the individualistic orientation heightened them. Further, heterogeneous teams were projected to be more successful at a task when subjects were primed with collectivism, supporting hypothesis 2. Finally, the perception of similarity partially mediated the relationship between heterogeneous-collectivists and projected success, in support of hypothesis 3. These findings suggest that a collectivistic mindset reduces attentiveness to differences within diverse teams, which in turn improves the team's projected likelihood of succeeding at a group task.

Study 1 offers evidence supporting all three hypotheses, but in an artificial context with hypothetical groups for whom performance is only subjectively predicted. Further, our manipulation of collectivism and individualism was not embedded in the actual task group, but rather was primed in subjects who read a scenario. To address these limitations, we undertook a second study using an archival data set of Himalayan mountain climbing expeditions. Study 2 further examines hypothesis 2, that collectivism moderates the relationship between national heterogeneity and team performance, in a natural setting with consequential team outcomes.

STUDY 2: METHOD

Empirical Setting

The Himalayan mountain range, which stretches across Pakistan, India, Nepal, Tibet, and China, is home to the world's most imposing peaks. It contains more than 100 mountains that are over 7,200 meters high, including Mt. Everest, the tallest mountain on Earth. This unparalleled

concentration of challenging climbing opportunities makes the Himalayas the most sought-after destination for accomplished mountaineers.

Advanced technology such as satellite imagery for weather forecasting is now available to climbers, but Himalayan expeditions remain exceedingly difficult. In addition to the daunting physical challenge of climbing, mountaineers routinely encounter treacherous cold, violent storms, and oxygen levels that, at the highest points, are only one-third of sea level. As an extreme sport, the mortality rate for mountaineering is more than three times that of parachuting and hang gliding, and more than 200 times that of scuba diving (Windsor, Firth, Grocott, Rodway, & Montgomery, 2009). Nonetheless, the number of groups making Himalayan ascents has increased steadily over the last several decades, from 100 in 1982 to a high of 421 in 2009. The vast majority of climbers attempt to summit in groups ranging from three to 14 climbers.

Data and Sample

We used the Himalayan Database (Salisbury & Hawley, 2004 [2013]) to further test hypothesis 2, that collectivism will mute the disruptive influence of national heterogeneity on group performance. Complete data on expeditions and expedition members cover more than 60 years of climbs, from 1950-2013. Our unit of analysis is the expedition. Himalayan expeditions share certain organizing principles. For example, support personnel—such as climbing Sherpas and cooks—are generally assigned to the expedition as a whole instead of to individual climbers, and most expeditions feature a leader who is designated in advance. While advancing up the mountain, expedition members rest together each night, and share meals and tents.

The Himalayan Database is a compilation of the detailed expedition records of Elizabeth Hawley, who since 1963 has served as the “unrivalled” chronicler of Himalayan expeditions (Jolly, 2010: 1). Hawley has obtained comprehensive information for the Himalayan Database in

two primary ways. First, she has conducted interviews with representatives of expeditions as they have passed through Kathmandu before embarking on their climbs. Because all expeditions must pass through Kathmandu before reaching the Himalayas, Hawley has spoken with individuals from nearly all the teams during the last half century (Salisbury & Hawley, 2004 [2013]: 6). In the course of these interviews, she collects facts such as the camps and support personnel used, the time to reach the summit, and information on climber injury or mortality (Jolly, 2010: 1). When Hawley and her team cannot physically interview expedition representatives, they obtain relevant information from mountaineering publications, often contacting mountaineers individually in order to clarify and verify the key details of their experiences (Salisbury & Hawley, 2004: 6).

Sample

The Himalayan Database contains information on 59,975 climbers that attempted Himalayan ascents in 8,184 expeditions between 1950 and 2013. We excluded several types of climbers from our analysis. First, given our focus on summiting success, we excluded the 3,651 climbers who elected to only go as far as base camp, verified by climbing permits issued by the Nepalese government which require expeditions to identify in advance each climber who will be ascending above base camp. In addition, we excluded 872 climbers who were registered to attempt a summit but failed to reach base camp (183 expeditions included at least one such climber), leaving us with 55,452 climbers in 7,968 expeditions.

Next, we excluded the 10,212 paid support personnel after calculating our control variable measuring climber support, which we describe below. This reduced our sample to 45,240 climbers in 7,962 expeditions.¹ Third, given our focus on group composition and consistent with

¹ The reduction in number of expeditions at this stage is due to certain expeditions comprising entirely hired personnel. A typical example: an all-Sherpa team is contracted to clear a trail in advance of commercial expeditions.

typical definitions of a group as having three or more members (e.g., Kashy & Kenny, 2000), we excluded 1,265 climbers who made ascents by themselves or with support personnel but no additional team members. This reduced our sample to 43,975 climbers in 6,697 expeditions. We also excluded 2,412 climbers who ascended in pairs, reducing our sample to 41,563 climbers in 5,491 expeditions.

Finally, climber age, one of our control variables described below, was missing for 1,219 climbers, or 2.93% of the remaining sample. These climbers were included in calculations of the control variable for the size of their group, but their age was coded as missing for the calculation of the control variable pertaining to their average expedition age. Age was missing for every climber in 31 expeditions comprising 174 climbers (0.4% of the remaining sample). Since we were unable to calculate an average age for these expeditions, we excluded them from our analysis. (However, we re-ran the analyses described below, assigning the mean group age (37.14 years) to those expeditions that were missing average age, and found no differences in the pattern of results.) Our final sample consisted of 41,389 climbers in 5,460 expeditions.

Dependent Variables

One advantage of the Himalayas data set is that the outcomes of expeditions are objective, meaningful, and consequential, qualities that are valuable and somewhat rare in group research (van Dijk et al., 2012). We operationalized group performance based on the most significant aspect of mountaineering: summiting success. We created two variables to assess this.

Summit ratio. We measured each expedition's summit ratio, or the ratio of climbers that summited to total climbers in the group ($\bar{x} = 0.32$, $s.d. = 0.49$).

Summit. We created a binary variable, which we coded as 1 when at least one climber in an expedition reached the summit of the target mountain and as 0 if no climbers in an expedition

reached the summit. Having at least one climber summit is a particularly meaningful measure of expedition success. Specifically, as the sociologist and climber Richard Mitchell (1983: 16) described, “It is not logistically feasible to offer all climbers a chance to reach the top...” Instead, the efforts of many often combine to make possible the summit bid of perhaps one or two climbers. In slightly more than half of the expeditions in our sample, at least one climber reached the summit ($\bar{x} = 0.58$, $s.d. = 0.49$). We estimated linear probability models for this dependent variable because they allow for a more straightforward interpretation of interaction effects than do nonlinear models (e.g., Hoetker, 2007).

Independent Variables

As in study 1, we used two independent variables to test our hypotheses: group collectivism and national heterogeneity.

Collectivistic group. Collectivistic group measures the extent to which each expedition is characterized as having a national collectivistic orientation. To calculate this, we first assigned each climber an individual collectivism score based on their recorded nationality and that country’s collectivism score. We used Hofstede’s Collectivism Index (www.geert-hofstede.com; see also Hofstede, 2001). Hofstede’s collectivism index includes scores for 101 countries on a 100-point scale that ranges from 6 (Guatemala) to 91 (U.S.), with higher numbers representing lower collectivism. Hofstede initially based the index on surveys of IBM in 64 different countries and then refined it through research on different populations such as airline pilots and civil service managers (e.g., Hofstede & Bond, 1984; Hofstede & Spangenberg, 1987). It is the most highly cited index of collectivism in use (e.g., *Culture’s Consequences* (Hofstede 1980 [2001]) has been cited over 20,000 times). Seventy-nine of the 106 countries represented by climbers in our sample had collectivism scores listed in Hofstede’s Index.

After assigning collectivism scores, we then averaged them within each expedition to obtain the expedition's group collectivism score. Next, we coded group collectivism as 1 for each expedition in which the average collectivism score of individual climbers within the expedition was equal to or lower than 66.5—the median expedition collectivism value in our sample—and as 0 if it was greater than the sample median. Two thousand seven hundred forty five expeditions were categorized as collectivistic and 2,746 expeditions as individualistic. By operationalizing collectivism in dichotomous terms, we followed precedent from previous literature where the construct has either been experimentally manipulated (e.g., Goncalo & Staw, 2006) or inferred from nationality (e.g., Earley, 1993). We also estimated our models measuring group collectivism continuously as the average collectivism score of all climbers in an expedition and obtained a similar pattern of results.

Even though the 27 countries (1,131 climbers) in our sample that were not coded in Hofstede's collectivism index² represented less than 2% of our data, we took several steps to impute collectivism values for them to ensure that excluding them from our analyses did not materially change our results. For example, we assigned to Algeria, Oman, Palestine, and Qatar the collectivism value that Hofstede listed for "Arab Countries." We assigned the USSR and five countries that are bordering/proximate to Russia and were formerly members of the USSR (Belarus, Georgia, Kazakhstan, Ukraine, and Uzbekistan) the score for Russia. We also assigned a collectivism value of 55 to Czechoslovakia, as this was the average of the values for Slovakia (52) and the Czech Republic (58). Thus, we were able to code a collectivism value for every climber in our sample. We also estimated our models using only the values derived by Hofstede and obtained an identical pattern of results.

² The full list of countries and corresponding collectivism values utilized in our analysis, as well as the countries in our sample that were not included in Hofstede's collectivism index, are available from the authors upon request.

National heterogeneity: Dispersion in nationality. National heterogeneity represents the extent to which each expedition included members from different nations. We measured national heterogeneity using Blau's (1977) index of diversity, which measures the sum of squares of the proportion of expedition members who come from each nation: $1 - \sum_{i=1}^N s_i^2$, where s_i is i 's share of nationality in the group and N is the total number of nationality categories. For example, an expedition with three climbers from Spain and one from Norway would have a national heterogeneity score of 0.38. In our sample, the mean national heterogeneity score across expeditions was 0.17 ($s.d. = 0.25$). We mean-centered this variable in all analyses.

Control Variables

Climber attributes within expeditions. We averaged climbers' age within expeditions ($\bar{x} = 37.01$ years, $s.d. = 9.98$) to create an age control variable ($\bar{x} = 37.14$, $s.d. = 7.06$), since being particularly young or old may diminish a climber's physical ability to reach the summit (e.g., Huey, Salisbury, Wang, & Mao, 2007). We also created a control variable for the proportion of female climbers in an expedition ($\bar{x} = 0.10$, $s.d. = 0.15$). Men were significantly more common; female climbers represented only 9.5% ($n = 3,931$) of the sample. Further, since group size could influence both group interactions and outcomes (Staats, Milkman, & Fox, 2012), and given the dangers of climbers' blocking key passages for subsequent mountaineers, we also controlled for the number of climbers in each expedition. The average group size of expeditions in our sample was 7.58 climbers ($s.d. = 4.91$). We also controlled for experience in the Himalayan region by constructing a ratio of climbers within an expedition who have attempted at least one prior climb divided by the total number of climbers in the group ($\bar{x} = 0.41$, $s.d. = 0.32$).

Climber support. Using oxygen increases a climber's probability of summiting. The variable 'oxygen ratio' represents the proportion of bottled oxygen users to total climbers in each group ($\bar{x} = 0.15$, $s.d. = 0.29$).

'Support ratio' represents the ratio of high-altitude porters and Sherpas to total climbers in each expedition. Support personnel are paid for carrying out a number of essential duties, such as breaking trail, fixing rope ahead of the climbers, and transporting supplies and guiding. Accordingly, a higher ratio of support personnel to climbers is likely to improve expedition success. The average support ratio was 0.21 ($s.d. = 0.31$).

Mountain and weather conditions. We included year and mountain dummy variables (fixed effects) in order to address unobserved heterogeneity between expeditions, since different mountains and the conditions in different years present varying challenges for climbers (Wooldridge, 2010). Thus our models analyze differences in outcomes only between expeditions that ascended the same mountain in the same year. While it is difficult to completely mitigate selection concerns in an observational study (e.g., Angrist & Pischke, 2009), by including these fixed effects the expeditions are more comparable. We also estimated a separate set of models that included controls for expedition season, and obtained essentially identical results.

Type of expedition. Himalayan expeditions are one of two types: commercial or non-commercial. Commercial expeditions are formed in an ad hoc manner, with potential clients choosing which expedition to join based on features such as price, reputation, and the company's record of successful client summits. Non-commercial expeditions, on the other hand, often emerge from preexisting social ties between climbers who are prominent within the mountaineering culture (see Krakauer, 1997: 44). Within our sample 1,077 expeditions, or 20%,

were commercial and 4,383, or 80%, were non-commercial. We created a control variable and coded commercial expeditions as 1 and non-commercial expeditions as 0 ($\bar{x} = 0.20$, $s.d. = 0.40$).

STUDY 2: RESULTS

Table 2 presents means, standard deviations, and correlations among our study variables. To test hypothesis 2, we first estimated a base equation that included the control variables, then in a second equation entered the independent variables for national heterogeneity and expedition group collectivism, and finally in the third equation included the predicted interaction terms, which consisted of the product of the relevant pair of independent variables.

Model 1 in Table 3 shows the base equation estimating an expedition's summit ratio. The control variables experience ratio, oxygen ratio, and support ratio were positively associated with expedition summit ratio. Increases in average expedition age, however, were negatively associated with expedition summit ratio. The proportion of climbers who were female, expedition size, and commercial status were not significantly associated with expedition summit ratio. Model 2 in Table 3 includes national heterogeneity and collectivistic orientation. National heterogeneity did not significantly predict summiting ($\beta = 0.022$, n.s.) but collectivistic groups were more likely to reach the summit ($\beta = 0.038$, $p < 0.01$). Model 4 in Table 3 similarly shows the base equation estimating the probability that at least one climber in an expedition summits. The coefficients are of the same significance and in the same direction as are those in Model 1, with the exception that group size significantly and positively predicted summiting success. As with Model 2, in Model 5 national heterogeneity did not significantly predict summiting ($\beta = 0.032$, n.s.) and collectivistic groups were more likely to reach the summit ($\beta = 0.069$, $p < 0.01$).

Insert Tables 2 and 3 About Here

Models 3 and 6 in Table 3 test hypothesis 2: that nationally diverse task groups will perform better when collectivism rather than individualism is prevalent. Model 3 shows that the interaction term for national heterogeneity and group collectivism was positive and significant (summit ratio: $\beta = 0.083, p < .05$), as does Model 6 (summit: $\beta = 0.120, p < .05$). To understand the form of the interactions, Figures 4 and 5 show that when expeditions were characterized by greater national heterogeneity, those groups whose climbers came from collectivistic nations were significantly more likely to summit than when expeditions were dominated by climbers from individualistic cultures (collectivistic: $\bar{x} = 0.16$, individualistic: $\bar{x} = 0.10$; $t = 2.35, p < .05$). These results offer additional support for hypothesis 2 since nationally diverse collectivistic expeditions outperformed similarly diverse individualistic expeditions.

Insert Figures 4 and 5 About Here

Additional Analysis: Individual Climbing Success

To examine whether summiting success for individual climbers was consistent with our group-level findings, we analyzed climbers' relational distance in nationality from the rest of their group members as a predictor of the focal climber reaching the summit. We operationalized climbing success as a binary indicator of whether the climber reached the top of their target peak. We constructed a Euclidean Distance measure with respect to nationality for each climber. Euclidean Distance is a common, well-validated measure that scholars of relational demography use to assess how distinct an individual is from other group members on a relevant dimension (e.g., O'Reilly et al., 1989). It is calculated as: $[\frac{1}{n} \sum_{j=1}^n (S_i - S_j)^2]^{1/2}$ where each individual i 's distance from the rest of their group with respect to nationality is obtained by taking the square root of the summed squared distance from the focal individual to each other member of the group, then dividing it by the total number of climbers in the expedition. A higher Euclidean

Distance indicates that an individual is more nationally distinct from the rest of the group. We found that climbers who were more different from their group were more likely to summit when they were members of collectivistic ($\beta = .038, p < .01$) rather than individualistic expeditions ($\beta = -0.002, n.s.$). This corroborates our group-level finding: collectivism reduces the disruptive effects of being different on both individual- and group-level performance.

STUDY 2: DISCUSSION

Study 2 supported hypothesis 2 since collectivism moderated the relationship between national heterogeneity and performance such that nationally diverse groups were more likely to summit when collectivism was more prevalent than individualism. We also found that collectivistic groups that were more nationally diverse were more likely to summit compared to collectivistic groups that were nationally homogeneous, suggesting that collectivism not only mutes the differences as found in study 1, but also enables heterogeneous groups to leverage national diversity to improve performance. These results support those found in study 1 but add external validity by examining Himalayan mountaineering, a setting that is both nationally neutral and in which group performance can be objectively evaluated.

GENERAL DISCUSSION

Across two very different studies, an experimental scenario and an archival analysis, we found that collectivistic task groups—hypothetical firefighters and Himalayan mountain climbers—were expected to and actually did perform better when members came from different national cultures. In contrast, subjects primed to be individualistic and individualistic task groups that were more heterogeneous were expected to and did in fact perform worse, consistent with the performance decrement found in past research on diverse groups (e.g., Kochan et al., 2003). Our laboratory experiment offered tangible evidence of the psychological mechanism underlying

this relationship: a collectivistic orientation blurred distinctions between nationally diverse group members, while an individualistic orientation accentuated these differences.

In study 1, collectivistically primed subjects perceived firefighters' level of similarity within the group to be equivalent regardless of whether the group was nationally homogeneous or heterogeneous, whereas individualistically primed subjects were more attentive to differences within groups. Individualistic subjects saw the homogeneous groups as having members who were significantly more similar to one another, compared to their perception of heterogeneous groups and compared to collectivistic subjects' perceptions of homogeneous groups. Likewise, these individualistic subjects viewed members of heterogeneous groups as significantly more different from one another than members of homogeneous groups, and also compared to collectivistically primed subjects' perceptions of both types of groups. And, we found that perceptions of similarity mediated the relationship between cultural orientation and group performance such that the collectivistic prime caused subjects to expect nationally heterogeneous groups to perform significantly better compared to individualistically primed subjects partly due to the perceived similarity of members within the group. The performance findings from study 1's lab context—that heterogeneous collectivistic teams were more likely to succeed—were confirmed in study 2's field setting, suggesting that the findings extend to real-world settings.

Theoretical Implications

Our findings offer important contributions to social identity theory. First, they suggest that collectivists are less attentive to differences in members' nationality, while individualists are more sensitive to these demographic differences. These findings provide theoretical insight into the concept of functional antagonism, which, though rarely tested empirically, specifies that as some attributes become more salient in a group, others become less so. We found that functional

antagonism played out as theorized for collectivists in that the collectivistic focus muted perceptions of demographic attributes and enabled higher performance, particularly in heterogeneous groups. This was not the case for individualists, who instead were more attentive to the distribution of members' demographic attributes. Thus we can conclude that people and groups with an individualistic orientation will be more sensitive to the distribution of members' demographic attributes and, regardless of the objective distributions of attributes among members, differences are more salient to individualists.

A second theoretical contribution is that linking a group's demographic composition to its performance may require understanding not just the distribution of demographic attributes but also the norms, values, and beliefs that make up the content of the attributes on which members differ. Our results suggest that this content can influence how task group members respond to the distribution of such attributes. Specifically, had we not assessed the climbing groups' cultural orientation or manipulated the cultural prime for experimental subjects, the actual relationship between group composition and group performance would have been obscured. This suggests that future research should more systematically examine both the distribution and the content of demographic attributes in task groups.

Third, a notable feature of our research is that even though collectivism was primed in one study and assessed in the other, the pattern of results was similar across the two studies. This indicates that it is the collectivistic mindset per se rather than one's nationality (which is only one source of collectivism) that influenced people's sensitivity to the distribution of demographic attributes in the task group.

Further, one might be tempted to speculate that individualists are more likely to stereotype different others given how much more they notice distributions of demographic attributes. We

suggest instead that their perceptions as subjects in the experiment or as climbers in individualistic expeditions were based on their orientation toward the group's composition. Specifically, these findings suggest that it is people's orientation toward the group's goals—collectivists being more focused on the group's goals and individualists less so—that is linked to their perceptions of demographic differences within the group. One implication of this is that changing the group's composition may be less likely to affect performance than changing its cultural or normative orientation.

Relatedly, collectivism is not just a cultural orientation but also a way of increasing members' alignment with group goals. In this sense, collectivism influences the salience of demographic categories among group members by reducing out-group bias. This feature of collectivism is crucial in group settings because it affects members' identification with their group—that is, whether personal attributes dominate, differentiating each member from one another or, instead, whether collective attributes are most salient and increase perceptions of similarity among group members. The relative salience of personal versus group-level attributes affects how closely members identify with their group's goals, and as such, their motivation to accomplish group goals.

Limitations and Future Directions

The limitations of our research may stimulate ideas for future research. First, we only examined the distribution and content of one demographic attribute—members' national culture. Future research should determine whether the distribution and content of other demographic attributes, both those that are relational (e.g., race, age) and those that are informational (e.g., functional expertise, education), are also important to consider simultaneously when predicting group performance. Collectivism may extend beyond distributions in national culture to affect

how members attend to the distribution of other attributes, but we also expect that the match between the demographic distribution and the content of various attributes should be explored. For example, research on gender has already shown that men and women react differently to differences in gender distributions (Chatman & O'Reilly, 2004), so gender might be a useful attribute to examine from this perspective.

In study 1 we only looked at one type of nationally heterogeneous group and so future research should examine whether our results are robust across different distributions of group members (e.g., 3-2) as well as different group sizes. In study 2, we inferred people's cultural orientation from their citizenship but did not measure it directly. Future research could usefully measure whether members feel like interchangeable exemplars of their group in collectivistic compared to individualistic groups.

Similarly, because the Himalayas data set is archival in nature, we did not have access to climbers' perceptions of similarity within their groups and were, therefore, unable to test the influence of collectivism on members' perceptions of similarity among nationally heterogeneous groups (H1), or the role of perceived similarity as a mediator between the collectivism/national diversity interaction and performance (H3). We did, however, conduct an additional analysis to try to determine whether such perceptions were operating in the expeditions. The Himalayan Database includes route notes, which typically contain information about the navigational route taken by a particular expedition, but sometimes also contain letters or diary-like entries written by climbers. Route notes of any substance were only available for a small subset of the climbing teams, but we found that these notes were not disproportionately written by any of the four conditions (individualistic/collectivistic; homogenous/heterogeneous). Viewing them as at least somewhat representative, we analyzed the text from 118 expeditions that had substantial route

notes using the Linguistic Inquiry Word Count program (LIWC; see Tausczik & Pennebaker, 2010). We created a custom dictionary of words and word stems that pertain to similarity (e.g., alike, simil*; asterisks denote wildcards so the program can recognize a variety of related words: for example simil* could be similarity, similar, or similarly). Our frequency analysis uncovered that route notes from heterogeneous-collectivist groups used more words related to similarity ($\bar{x} = 0.31$) than did those from heterogeneous-individualist groups ($\bar{x} = 0.11$; $F(45) = 4.24, p < .05$), consistent with study 1 findings. Members of diverse collectivistic expeditions wrote more about members' similarity than did members of diverse individualistic expeditions. These suggestive findings warrant designing externally valid research that examines whether similarity perceptions mediate the relationship between demographic heterogeneity and group performance.

Practical Implications

Our findings offer a key practical implication for team managers in organizational settings: orienting group members to be more collectivistic, a perspective that can deliberately be instilled, can enable them to transcend the distraction and negative performance often associated with demographic heterogeneity in groups. This is important because a collectivistic orientation allowed climbing groups to outperform not only individualistic groups but also collectivistic groups that were more homogeneous. This suggests that a collectivistic orientation enables groups to leverage their diversity to drive performance. It is noteworthy that many “ice-breaker” activities designed for group members to get to know each other focus on individuals sharing unique aspects of themselves—essentially an individualism prime. Perhaps shifting these types of exercises to emphasize what unites rather than what distinguishes individuals—for example, asking people to “pair up and identify 10 things you share in common” rather than “share a fun fact about yourself”—could usefully instill a more collectivist mindset in new teams.

Collectivism is a particularly potent construct as it not only represents a major distinction in national cultures, but it also influences the extent to which group members identify with their task group's goals. Our research suggests that contextualizing diversity by considering not just the distribution of nationality (and possibly other attributes) but also how the content—the norms, values, and beliefs associated with a group's demographic attributes—influences members' reactions to the distribution of those attributes, is important for understanding how groups are likely to perform.

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Table 1: Analysis of Variance for Main Outcome Variables – Study 1

	Similarity			Success		
	d.f.	F	Observed Power	d.f.	F	Observed Power
Main Effects:						
National heterogeneity	1	5.96**	0.56	1	2.46	0.22
Collectivistic group	1	1.36	0.17	1	3.90	0.34
Interaction Effects:						
Heterogeneity×Collectivistic	1	6.50**	0.66	1	7.36**	0.71
Error	317			317		
Model R^2	0.04			0.09		

* $p < .05$, ** $p < .01$, two-tailed tests.

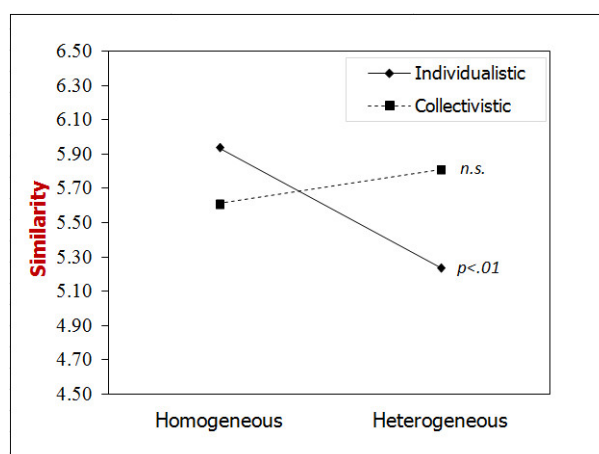
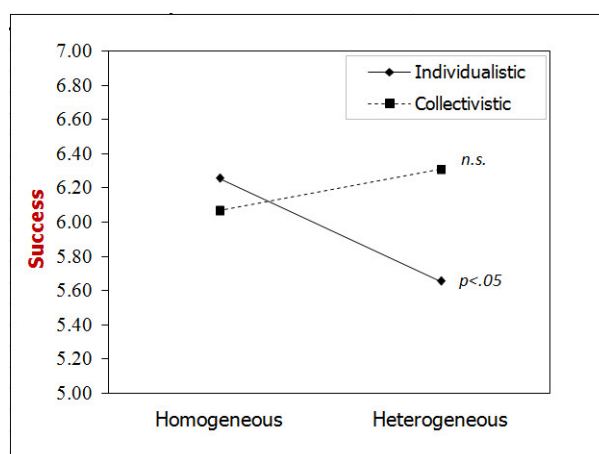
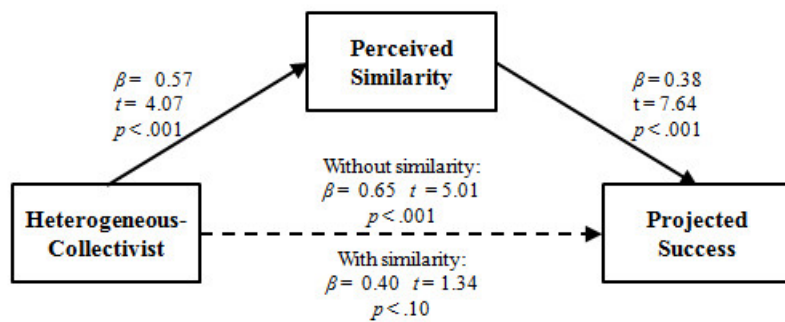
Figure 1: Graphed Interaction Predicting Perception of Team Member Similarity – Study 1**Figure 2: Graphed Interaction Predicting Projected Team Success – Study 1**

Figure 3: Main and Mediating Effects of Condition, Similarity, and Team Success – Study 1



* Dashed line indicates that the relationship was reduced in significance in the full model (i.e., that there is mediation); $Z = 3.47, p < .001$.

Table 2: Means, Standard Deviations, and Correlations Among Study 2 Variables – Study 2

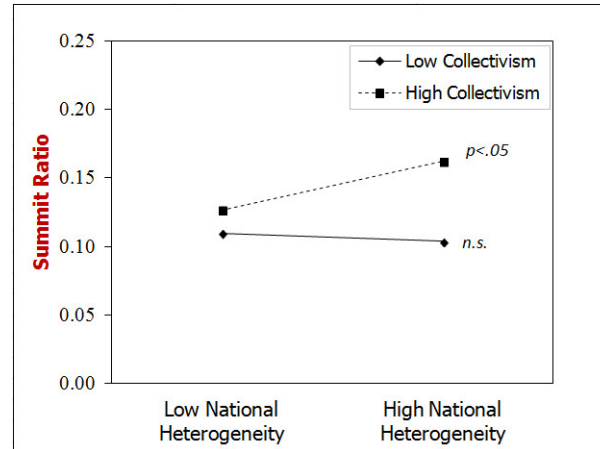
Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Average age	37.14	7.06	1										
2. Proportion female	0.10	0.15	0.133*	1									
3. Group size	7.58	4.91	-0.045*	-0.001	1								
4. Experience ratio	0.41	0.32	0.187*	-0.038*	-0.088*	1							
5. Oxygen ratio	0.15	0.29	0.143*	0.082*	0.129*	0.200*	1						
6. Support ratio	0.21	0.31	0.255*	0.137*	-0.051*	0.094*	0.531*	1					
7. Commercial expedition	0.20	0.40	0.294*	0.114*	0.174*	0.045*	0.245*	0.250*	1				
8. Collectivistic group	0.50	0.50	-0.095*	-0.079*	0.049*	0.045*	-0.019	-0.015	-0.278*	1			
9. National heterogeneity	0.17	0.25	0.155*	0.091*	0.165*	0.146*	0.191*	0.136*	0.465*	-0.218*	1		
10. Summit ratio	0.32	0.35	0.073*	0.075*	-0.030*	0.103*	0.309*	0.270*	0.165*	-0.007	0.103*	1	
11. Summit	0.58	0.49	0.064*	0.060*	0.120*	0.079*	0.298*	0.222*	0.163*	0.029*	0.115*	0.787*	1

Note: $N = 5,460$ expeditions. * $p < .05$

Table 3: OLS Estimates of Relational Heterogeneity and Collectivism on Expedition Success – Study 2

	(1)	(2)	(3)	(4)	(5)	(6)
	Summit Ratio	Summit Ratio	Summit Ratio	Summit Ratio	Summit Ratio	Summit Ratio
Average age	-0.00538** (0.000761)	-0.00522** (0.000762)	-0.00538** (0.000765)	-0.00452** (0.00110)	-0.00421** (0.00110)	-0.00444** (0.00110)
Proportion female	-0.0416 (0.0280)	-0.0377 (0.0280)	-0.0400 (0.0281)	-0.0136 (0.0408)	-0.00562 (0.0406)	-0.00895 (0.0407)
Group size	0.00121 (0.000741)	0.000695 (0.000744)	0.000683 (0.000749)	0.0134** (0.00145)	0.0125** (0.00144)	0.0125** (0.00146)
Experience ratio	0.136** (0.0156)	0.131** (0.0157)	0.131** (0.0157)	0.135** (0.0228)	0.127** (0.0229)	0.127** (0.0229)
Oxygen ratio	0.509** (0.0205)	0.505** (0.0205)	0.508** (0.0204)	0.546** (0.0291)	0.541** (0.0291)	0.544** (0.0291)
Support ratio	0.159** (0.0179)	0.157** (0.0179)	0.160** (0.0179)	0.188** (0.0253)	0.185** (0.0253)	0.189** (0.0254)
Commercial expedition	0.00502 (0.0114)	0.0135 (0.0128)	0.0151 (0.0128)	0.00306 (0.0169)	0.0209 (0.0190)	0.0234 (0.0190)
National heterogeneity		0.0223 (0.0192)	-0.0116 (0.0238)		0.0321 (0.0282)	-0.0172 (0.0352)
Collectivistic group		0.0375** (0.00880)	0.0377** (0.00880)		0.0690** (0.0135)	0.0694** (0.0135)
Heterogeneity×Collectivistic			0.0828* (0.0340)			0.120* (0.0502)
Observations	5460	5460	5460	5460	5460	5460
Adjusted R^2	0.316	0.318	0.319	0.210	0.214	0.214

Robust standard errors in parentheses. ⁺ $p < .10$, * $p < .05$, ** $p < .01$

Figure 4: Graphed Interaction Predicting Summit Ratio – Study 2**Figure 5: Graphed Interaction Predicting Summit (Binary) – Study 2**