Taking the bite out of culture: The impact of task structure and task type on overcoming impediments to cross-cultural team performance

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Summary   Research on the effect of cultural diversity on team performance remains inconclusive. We propose to resolve the competing predictions of the information/decision making versus the social categorization theories by integrating two task-related theories, the situational strength theory and the circumplex model of group tasks. We propose that high task specificity enables similar interpretations and shared understanding among team members, which is needed for effective "execute" (convergent) tasks, is characterized by team cooperation and interdependence. Low task specificity, in contrast, is beneficial for "generate" (creative) tasks, because it does not place constraints on generating original ideas and does not require tight coordination among the team members. We tested the effects of situational strength and task type on the relationship between cultural diversity and team performance in two experiments with 86 and 96 dyads in the first and second experiments, respectively. In both experiments, heterogeneous (Israeli–Singaporean) and homogeneous dyads (Israeli–Israeli and Singaporean–Singaporean) worked under low or high task specificity. In Study 1, dyads performed convergent execution tasks, and in Study 2, they performed creative idea-generation tasks. The impediment of multicultural-ism was reduced in execute (convergent) tasks under high task specificity and in generate (divergent) tasks under low task specificity. Copyright © 2013 John Wiley & Sons, Ltd.

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Intensifying globalization in all sectors means an increasing number of multicultural teams, yet whether team members from different cultural backgrounds collaborate effectively with each other on numerous types of tasks remains unanswered. The extant research literature on team diversity makes no conclusive inference about the effect of team diversity, specifically cultural diversity, on team performance (Bledow, Frese, Anderson, Erez, & Farr, 2009). The information/decision-making approach suggests that the large and diversified pool of knowledge, skills, and abilities available to culturally diverse teams enhances team performance (Easely, 2001; Van Knippenberg, De Drue, & Homan, 2004). By contrast, social categorization theory (Tajfel, 1978; Turner, 1987) asserts that cultural diversity hinders team performance because categorization of team members into in-groups and out-groups hampers team processes (Huber & Lewis, 2010). The empirical evidence linking cultural diversity to team performance is equivocal. A meta-analysis of 42 studies summarizing the effects of cultural diversity on team performance found a null effect but also showed that individual effect sizes range from −.60 to .48 (Stahl, Maznevski, Voigt, & Jonsen, 2010). These conflicting theories and findings hint at the presence of undetected moderators of the relationship between cultural diversity and team performance, highlighting the importance of gaining a deeper understanding of the conditions under which cultural diversity predicts team performance (Van Knippenberg & Schippers, 2007).

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The objectives of this article are to explain and resolve the competing predictions of the information/decision-making approach, versus the social categorization theory, which assert different relationship between cultural diversity and team performance. To this end, we integrate two task-related theories, which together offer a promising conceptual framework for explaining and resolving the inconsistency. The first is the situational strength theory, which proposes that strong situations such as specific and clear tasks dictate a clear and specific response (Mischel, 1977; Parker & Ohly, 2008) and attenuate the effects of diverse personal characteristics (Meyer, Dalal, & Hermida, 2010) and cultural background (Erez, 2010; Erez & Nouri, 2010) on behavioral outcomes.

The second is the task type theory, as reflected in McGrath's (1984) circumplex model, which differentiates between tasks along two dimensions—cognitive versus behavioral task demands and low versus high task interdependence. For example, "execute" tasks, which require perceptual-motor coordination, represent the interdependent behavioral type, whereas "generate" tasks of idea generation, requiring only little coordination, represent the cognitive low interdependence type.

Integrating insights from both theories, we propose that strong situations conveyed by high task clarity and specificity constitute an advantage for culturally diverse teams performing execute tasks, which require high coordination and interdependence among team members to reach the expected behavioral outcomes. By contrast, low task specificity benefits culturally diverse teams when performing generate tasks, which require them to generate multiple diverse ideas without the constraints of high team interdependence and high team coordination. In the current research, we view task specificity, and task type as potential moderators; thus, we designed two studies to test for the moderating effect of task type and situational strength on the relationship between team cultural diversity and team performance outcomes. Study 1 tested the moderating effect of task specificity on the relationship between team cultural diversity and team performance in an execute task. Study 2 examined the same moderating effect of task clarity and specificity on a generate task. The next section elaborates on the two moderators of situational strength and task type.

Situational Strength

Person–situation interaction theories recognize the joint effect of the person and the situation on behavior (e.g., Bandura, 1986; Mischel, 1977). Mischel (1977) proposed that the dominance of personality versus situation on individual behavior depends on the situational strength, which conveys the degree to which the situation constrains variability in the expression of personality (Cooper & Withey, 2009; Meyer et al., 2010; Mischel, 1977). Weak situations do not provide clear and specific cues for sense making and leave room for individual discretion, increasing the variance in responses to the situation given by people with different personalities and cultural backgrounds (Meyer et al., 2010; Mischel, 1973, 1977). Conversely, strong situations provide clear signals about what is expected, restricting the range of appropriate behaviors and leaving little room for individual discretion.

We propose that situational strength moderates the relationship between team cultural diversity and team performance such that strong situations provide clear and specific cues that evoke similar responses in members of different cultures. Under weak situations, cultural values—which are represented in the self—serve as criteria for interpreting the meaning of the situation (Erez & Earley, 1993), resulting in different interpretations, that is, cultural variability comes into play. Strong situations provide clear and specific situational cues to all team members, no matter their cultural diversity, thereby reducing the variance in members' responses. Hence, cultural diversity may have a positive effect on generate task performance under weak situations, which allow culturally diverse resources needed to generate multiple solutions to emerge. By contrast, cultural diversity may have a negative effect on execute tasks under weak situations that require high coordination and convergence towards one correct solution.

The current research investigates the effect of situational strength in the form of task clarity and specificity on the performance of culturally diverse teams involved in execute convergent tasks versus generate divergent tasks. Task specificity is defined as the extent to which cues regarding work-related responsibilities or requirements are available and easy to understand (Meyer et al., 2010).

High task specificity may have a positive effect on execute tasks because it leads culturally diverse team members to interpret task requirements in the same way which facilitates coordination. Nevertheless, high task specificity may have a negative effect on generate, creative tasks because it decreases employee autonomy and intrinsic motivation (Amabile, 1996), reducing the need for exploration, which is essential in generating creative ideas (Parker & Ohly, 2008). Therefore, we propose that task specificity will have a positive or negative effect on performance depending on the task type.

Task Type

Hackman and Morris (1975) compared group interaction and performance in different types of tasks. They looked at production tasks, discussion tasks, and problem-solving tasks and others and concluded that one cannot fully understand group performance without taking into account the nature of the task being performed, as the specific roles that group interaction plays in a given situation will depend substantially on the task type. A recent review illustrated the importance of considering core team characteristics in conjunction with task type (Wildman et al., 2012).

The task circumplex model, developed by McGrath (1984), differentiates between four main types of tasks, generate, choose, negotiate, and execute tasks, which differ along two dimensions. The horizontal dimension differentiates between tasks entailing cognitive and behavioral performance requirements. The vertical dimension reflects the degree to which coordination is needed to accomplish the task. At the top of the circumplex are collaborative tasks such as group idea-generation tasks. In these tasks, each member can independently contribute ideas, and each idea adds to the group's score. At the bottom of the circumplex are high interdependence tasks that require coordination, especially under weak situations of low task specificity.

In the current study, we investigate the interaction effect of cultural diversity and situational strength on the performance of two types of tasks: (i) the execute task, which places high demand on group communication and coordination and requires convergent thinking towards one correct solution; and (ii) the generate task, requiring the generation of multiple ideas by free associations and new connections between independent constructs (Guilford, 1967), with no need for high coordination and interdependence. We conducted two studies that differed in their task type. Study 1 tested for the moderating effect of task specificity on the indirect effect of team cultural diversity on team performance of an "execute" task, via team processes of cooperation and conflict. Study 2 tested for the same moderating effect of task specificity on the indirect effect of team cultural diversity on the performance of "generate" tasks, via the aforementioned two mediators and one additional mediator: the intensity and depth of communication messages. Following the two independent studies, we also tested for the moderating effect of the interaction between task specificity (high/low) and task type (execute/generate) on the relationship between team cultural diversity and team performance by standardizing the performance outcomes of the execute and generate tasks.

Study 1: Effects of Team Cultural Diversity and Situational Strength on Execute Task Performance

Study 1 aimed to test the effect of team cultural diversity (i.e., homogeneous and heterogeneous dyads) on team execute type task performance under high and low task specificity, representing the situational strength.

Cultural diversity

Heterogeneous groups can potentially outperform homogeneous groups because their team members rely on a large pool of knowledge and perspectives when involved in complex decision-making and idea-generation tasks (Bowers, Pharmer, & Salas, 2000; Van Knippenberg et al., 2004). This observation suggests that cultural diversity

would benefit team performance of generate creative tasks, defined in terms of idea fluency and originality (Torrance, 1974). However, a diverse pool of knowledge may not be enough when called upon to perform execute tasks, which require implementation of well-coordinated task procedures (De Dreu & Weingart, 2003). Keeping all other factors equal, culturally diverse teams, compared with culturally homogeneous teams, face the challenge of reducing the variance in perspectives and in interpreting the responses needed to perform the team task, which stem from their diverse cultural values and norms. Homogeneous teams, on the other hand, use their shared cultural norms and values to better cooperate and coordinate their activities with fewer potential conflicts than culturally heterogeneous teams (Rico, Sánchez-Manzanares, Gil, & Gibson, 2008). We, therefore, hypothesize the following:

> *Hypothesis 1*: Cultural diversity will impede team performance of execute tasks, resulting in higher levels of performance in culturally homogeneous versus heterogeneous teams.

Task specificity

Cooperation is the key characteristic of execute tasks (McGrath, 1984). The degree of cooperation versus conflict depends on team members' similarity in perspectives, values, or interests concerning the best way to coordinate their actions to accomplish a task (Argote & McGrath, 1993; McGrath, 1984; Rico et al., 2008). One factor that may influence the building of shared knowledge and understanding is situational strength, as conveyed by the level of task specificity. Some researchers view situational strength as "the most important situational moderating variable" (Snyder & Ickes, 1985, p. 904).

Specific and clear instructions and expectations enable team members to interpret the task requirements in the same way and to better coordinate their behaviors, compared with low task specificity. Task specificity is of particular importance in execute convergent tasks that require a high level of interdependence and coordination among team members. Therefore, we hypothesize the following:

> *Hypothesis 2*: When performing a convergent execute task, high task specificity will lead to higher performance outcomes than will low task specificity.

The effects of task specificity and cultural diversity on team performance

Similar to individual differences, cultural differences are likely to manifest themselves in weak situations of low task specificity more than in strong situations of high task specificity. In culturally diverse teams, task specificity becomes even more crucial than in homogeneous teams, because the diversity in cultural background and perspectives adds another source of variance to the interpretation of task requirements and to coordination of team members' actions. The event management approach (Maznevski & Peterson, 1997) suggests that individuals recognize events and evaluate and respond to them on the basis of their past experiences and the situation's characteristics. Past experiences are encoded in cognitive schemes that are shaped by culture. In strong situations, these schemes are less relevant for interpreting the situation because the situation itself conveys clear cues that enable similar interpretations by culturally diverse people (Meyer et al., 2010). As a result, the variance in perceptions and responses among team members is minimized, and a shared "social cognition" is generated, resulting in better coordination and performance levels in culturally diverse teams.

By contrast, in weak situations of low task specificity, responses to tasks are less dictated by the task itself, and more dictated by the diverse cultural norms of the team members, resulting in different interpretations of task requirements and in poor coordination and performance. Given the variance in cultural values and norms of members in culturally diverse teams, low task specificity will result in misunderstanding and miscommunication, precluding the development of a shared understanding and high coordination needed for team performance (Erez & Earley, 1993). We, therefore, hypothesize the following:

Hypothesis 3: Task specificity will moderate the effect of team cultural diversity on team performance of execute tasks. Team cultural diversity will impede team performance under low task specificity but not under high task specificity.

Situational strength is also expected to reduce conflicts and disagreements. We elaborate on this hypothesis in the next section.

The effect of team cultural diversity and task specificity on team processes and team performance

Task specificity influences team processes and team performance outcomes (Miron-Spektor, Erez, & Naveh, 2011). Specifically, in the present study, we examine the effects of task specificity on interpersonal processes of team cooperation and team conflict in culturally homogeneous and heterogeneous dyads.

Heterogeneous teams encounter difficulties in reaching a consensus and solving problems because of differences in the team members' knowledge base, prior experience, and understanding of the situation (Van Knippenberg & Schippers, 2007). As a result, heterogeneous teams are prone to misunderstandings and lack of trust, which inhibit information sharing (Argote & McGrath, 1993; Gruenfeld, Mannix, Williams, & Neale, 1996). Therefore, we expect culturally diverse teams to have more difficulties in team coordination and cooperation and to face more intra-group conflicts than homogeneous teams (Harrison, Price, Gavin, & Florey, 2002).

Low levels of task specificity and clarity impose increased demands on team members and challenge coordination patterns, aggravating cooperative efforts and increasing conflict (Edmondson, Dillon, & Roloff, 2007).

Mistrust, stereotyping, communication difficulties, conflicts, and interpersonal stress are less likely to occur in homogeneous than in demographically diverse groups (Harrison et al., 2002; Van Knippenberg & Schippers, 2007). As a result, homogeneous groups may function better than heterogeneous groups, resulting in higher levels of performance. However, task specificity may mitigate the deleterious effects of cultural diversity on team processes and performance outcomes because team members are likely to respond similarly to clear situational cues, regardless of their cultural diversity. Adding the mediating effect of team processes of cooperation and conflict to Hypothesis 3 on the moderating effect of task specificity on the relationship between cultural diversity and team performance of execute tasks, we hypothesize the following:
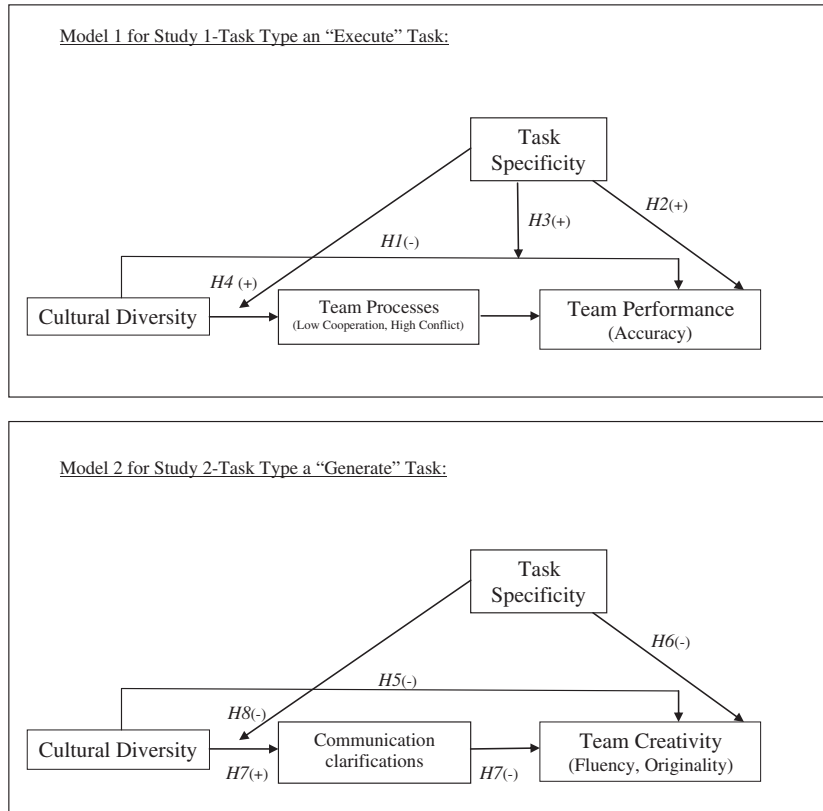
Hypothesis 4: Task specificity will moderate the mediating effect of the team processes of conflict and cooperation on the relationship between team cultural diversity and team performance, such that the mediating effect will be stronger under low rather than high task specificity.

Figure 1 displays our four hypotheses and the integrated research model.

Study 1: Methods

Participants

Eighty-six dyads (two-person work teams) of undergraduate students participated in the experiment. The participants' mean age was 23.17 years (*SD* = 2.34 years). Sixty-five percent (65 percent) of the participants were female, and 35 percent were male. Students came from a variety of functional backgrounds such as accounting (20.6 percent), actuarial science (0.6 percent), architecture (0.6 percent), biotechnology engineering (4.0 percent), business (23.0 percent), computer science (8.6 percent), economics and management (5.7 percent), food engineering (2.3 percent), industrial engineering and management (33.9 percent), and math education (0.6 percent). In Singapore, although the country is diverse, the university population is not. At the University where we drew our sample, 85 percent of the students have a Chinese ethnic background. Given the overwhelming proportion of students with a Chinese ethnic background, we decided to recruit only ethnic Chinese students as Singapore participants in both studies.

Note. Hypothesis 9 (*H9)* regarding the three way interaction of performance (accuracy/creativity) as predicted by cultural diversity, task specificity and task type does not have a graphical representation in the models.

Figure 1. Research models

Culturally diverse dyads comprised one student from Singapore and one from Israel. This demographic profile represents culturally diverse dyads because the two nations differ substantially on their tightness–looseness culture (Gelfand et al., 2011). Loose cultures tolerate deviant behaviors, but not tight cultures, which restrict the variety of acceptable responses and sanction deviant responses (Gelfand et al., 2011). (Singapore is a "tight" culture, ranked 4 out of 33 countries, whereas Israel is a loose culture, ranked 31 on the tightness scale.)

Singapore and Israel also differ on the cultural values of uncertainty avoidance, power distance, and collectivism/individualism (House, Hanges, & Javidan, 2004).

Design

Study 1 employed a 2 (cultural diversity) by 2 (task specificity) between-subjects factorial design. The 86 dyads were randomly assigned to the four experimental conditions: 40 dyads were culturally diverse (Israeli–Singaporean) and 46 were culturally homogeneous (27 Israeli–Israeli dyads and 19 Singaporean–Singaporean dyads). Half of the dyads in each condition were randomly assigned to the high task specificity and half to the low task specificity condition.

Procedure

The experiment took place simultaneously in Israel and Singapore. A synchronous computer communication (via the MSN messenger program) served for conducting interpersonal communication and for performing the computerized task.

Upon arriving at the computer lab for the experiment, all participants filled in a preliminary electronic question-naire that contained demographic items. After completing the questionnaires, each dyad member had 8 minutes to become acquainted with their partner before beginning the actual task. To ensure procedure consistency, the experimenter read from a scripted protocol, and participants received written task instructions in English. They were told that a reward of $12 would be given to each dyad member of the two dyads who received the highest performance scores.

The Singaporean dyads interacted in English (Singapore's official language and lingua franca in the University); the Israeli dyads interacted in Hebrew (Israel's official language), and the heterogeneous dyads interacted in English. English language proficiency did not affect task performance, as further described in the Study 1: Results section.

Upon completion of the task, participants filled out a questionnaire consisting of the manipulation check and questions regarding team processes of cooperation and conflict.

Execute task. A two-way communication version of a figure reproduction task developed by Leavitt and Mueller (1951) was adapted for the purpose of this study. The task involved reproducing a graphic figure. One of the dyad's members served as the "sender" who verbally and accurately described the figure to the "receiver" whose task was to reproduce the figure, using a PowerPoint program. The receiver was able to ask the sender questions, interrupt the verbal instructions for clarification, and so on. The figure comprised six geometric shapes, which when integrated composed the complete figure. Participants were asked to work on the task for 20 minutes, as rapidly and accurately as possible.

Task specificity manipulation. In the high task specificity condition, the six geometric shapes formed a house, which allowed dyad members to relatively uniformly decode and identify the characteristics of the six shapes that comprised the figure to be drawn. In contrast, in the low task specificity condition, the same six shapes formed a figure that was completely abstract and did not have any particular meaning (see Figure 2 for illustrations).
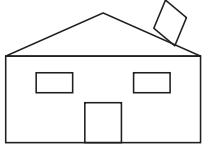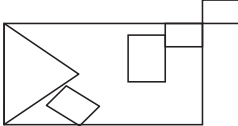

Figure 2. An illustration of the studies tasks' figures under strong and weak conditions.

In addition, participants in the high task specificity condition received more detailed instructions than in the low task specificity condition. In the high task specificity condition, participants were told that

> *the geometric shapes should be reproduced to compose the complete figure. Each shape should be identical to the original shape and should be correctly positioned on the page.*

By contrast, in the weak situation, participants received general instructions to reproduce the figure as accurately as possible.

Measures

Manipulation check. The task specificity manipulation was assessed with a self-developed four-item scale (i.e., "the goal of this task was very clear to me" and "the figure that had to be reproduced was specific and clear enough to communicate/reproduce it"). Responses were given on a 7-point Likert-type scale from 1 = *strongly disagree* to 7 = *strongly agree*. Cronbach's α for this measure was .74.

Task performance. Two independent judges evaluated the quality of the figure reproduction. One team reproduction was deleted because it could not be retrieved from the computer.

The judges used a three-item rating scale developed for this study: (i) the degree of similarity between the drawn figure and the original figure (evaluated on a 7-point scale from 1 (*extremely different*) to 7 (*identical*)); and (ii) the difference in size between the drawn figure and the original figure. The difference was computed by the mean of the absolute height and width differences between the reproduced figure and the original figure. (iii) The number of correct shapes in the reproduced figure (i.e., was a rectangle reproduced as a rectangle?). To transform the scale of the latter item into a 1–7 scale, the ratio of the correct number of figures-to-a-total of six figures was multiplied by 7.

The level of agreement between the two judges was acceptable (general similarity score: $ICC(3,2) = .91$, $p < .01$; object-to-target size similarity score: $ICC(3,2) = 1$, $p < .01$; the number of correct elements: $ICC(3,2) = .89$, $p < .01$). The three performance scores were standardized and averaged into one general accuracy performance score.

Cooperation. Team cooperation was measured using a four-item scale (i.e., "My partner and I were cooperative with each other"), using a 7-point Likert-type scale from 1 = *strongly disagree* to 7 = *strongly agree*, adapted from Kramer and Dailey (1997). Cronbach's α for this measure was .92.

Conflict. Intra-group conflict consisted of three subscales, each with three items, adapted from Jehn and Mannix (2001), using a 7-point Likert-type scale from 1 = *strongly disagree* to 7 = *strongly agree*: (i) relational conflict (i.e., "How much relationship tension was there between your partner and you?"), (ii) task conflict (i.e., "How frequently did your partner and you have disagreements about the task you were working on?"), and (iii) process conflict (i.e., "How often were there disagreements about who should do what?"). A confirmatory factor analysis showed that a one-factor model was more appropriate than a three-factor model, indicating an overall conflict rather than specific conflict types. Therefore, we averaged the three subscales into one score of intra-team conflict. Cronbach's α was .93.

Control variables. To provide a more robust test of the hypothesized model, we also controlled for other forms of diversity such as diversity in age, measured by the within-dyad standard deviation in age, as well as gender and functional diversity (0 = *team members have the same gender or functional background* and 1 = *team members have different gender or functional background*).

We also controlled for team members' average level of English proficiency by using a single-item Likert scale ranging from 1 = *I can hardly speak English* to 5 = *I can speak English very well*.

Finally, we controlled for team members' average level of cultural intelligence (CQ)—the ability to function and manage effectively in culturally diverse settings (Earley & Ang, 2003)—because previous research suggested that culturally diverse teams can draw on members' CQ to overcome potential negative processes associated with cultural diversity (Ang, Van Dyne, & Tan, 2011). Team members reported their CQ using the 20-item CQS

(Ang et al., 2007; i.e., "I check the accuracy of my cultural knowledge as I interact with people from different cultures"). Responses were given on a 7-point Likert-type scale from 1 = *strongly disagree* to 7 = *strongly agree*. Cronbach's α was .88.

Study 1: Results

Descriptive statistics

The means, standard deviations, and inter-correlations among all team-level variables appear in Table 1. Cultural diversity was not related to the group process variables, but it was significantly negatively related to task performance ($r = -.34$, $p < .01$), with the culturally homogeneous dyads performing better than the culturally diverse dyads. Task specificity was positively related to task performance ($r = .42$, $p < .01$), with significantly higher performance levels by dyads who performed under high versus low task specificity.

No control variable was significantly related to task performance (rs ranged from $-.17$ to .11, all *ns*). Team members' CQ was positively related to cooperation ($r = .29$, $p < .01$) and negatively related to conflict ($r = -.26$, $p < .05$). The remaining control variables were unrelated to the group process variables (rs ranged from $-.20$ to .10, all *ns*).

Manipulation check

Results of the manipulation check revealed a significant main effect for the task specificity manipulation ($t(85) = 4.61$, $p = .000$), indicating that dyads under a high task specificity condition perceived the task to be clearer ($M = 5.85$, $SD = 0.62$) than dyads under the low task specificity condition ($M = 5.19$, $SD = 0.71$).

Measurement equivalence of cooperation and conflict

Measurement equivalence was tested following Riordan and Vandenberg (1994). The equality of the variance–covariance matrices between Israel and Singapore was sufficient as indicated by the statistical significance of the chi-square values associated with each of the two variables at $p < .05$ (cooperation: $\chi^2 = 83.85$, $df = 1.25$; conflict: $\chi^2 = 98.79$, $df = 2.29$).

The equality of factor form was demonstrated because the confirmatory factor analysis model generated from the Israeli sample fits the data structure of the Singaporean sample equally well and in the same way (cooperation: $CFI = 0.99$, $NFI = 0.97$, $RMSEA = 0.04$; conflict: $CFI = 0.96$, $NFI = 0.93$, $RMSEA = 0.09$), and the levels of CFI and NFI were within the acceptable range.

To sum, there was a good fit of the subscale items to their corresponding factors indicating that each factor model (cooperation and conflict) is a tenable model. The assumption that the item-factor loadings are equal in both sub-samples was also supported.

Hypotheses testing

Effects of cultural diversity on team performance (Hypothesis 1). Hypothesis 1 was supported. Controlling for team members' average CQ and English proficiency, as well as teams' age diversity, gender diversity, and functional diversity, the analysis of covariance (ANCOVA) revealed a significant main effect of cultural diversity on performance ($F(1, 77) = 23.43$; $p < .01$, $\eta^2 = 0.23$). Homogeneous dyads ($M = 0.31$, $SD = 0.81$) performed better than heterogeneous dyads ($M = -0.36$, $SD = 1.09$).

Effects of situational strength on team performance (Hypothesis 2). Hypothesis 2 was supported. Controlling for team members' average CQ and English proficiency, as well as teams' age diversity, gender diversity, and functional diversity, ANCOVA demonstrated a significant main effect of task specificity on performance ($F(1, 77) = 29.95$; $p < .01$, $\eta^2 = 0.28$). Dyads in the high task specificity condition ($M = 0.29$, $SD = 0.62$) performed significantly better than dyads under the low task specificity condition ($M = -0.29$, $SD = 0.71$).

Table 1. Descriptive statistics and correlations of team-level variables (Study 1).

Variable	M	SD	1	2	3	4	5	6	7	8	9
Dependent variable											
1. Task performance	0.00	1.00									
Mediating variables											
2. Cooperation	5.92	0.74	.42**								
3. Conflict	1.59	0.63	−.15	−.48**							
Independent variables											
4. Cultural diversity (0=no, 1=yes)	0.47	0.50	−.34**	−.16	.09						
5. Task specificity (0=low, 1=high)	0.50	0.50	.42**	.16	−.06	.00					
Control variables											
6. Team members' cultural intelligence	4.69	0.50	.11	.29**	−.26*	−.05	.02				
7. Team members' English proficiency	4.24	0.50	.11	.10	−.20	−.03	.06	.27*			
8. Age diversity	2.04	1.30	.03	−.02	.09	.50**	−.02	.05	−.04		
9. Gender diversity (0=no, 1=yes)	0.47	0.50	−.12	−.06	.09	−.07	−.09	.07	.14	.01	
10. Functional diversity (0=no, 1=yes)	0.71	0.46	−.17	−.13	.03	.49**	−.13	−.01	−.03	.17	.08

Note: $N=86$ teams. Task performance is reported as a standardized mean score.
*$p < .05$; **$p < .01$.

Task specificity as a moderator (Hypothesis 3). Hypothesis 3 was also supported. Controlling for team members' average CQ and English proficiency, as well as teams' age diversity, gender diversity, and functional diversity, ANCOVA showed a significant interaction effect of task specificity by cultural diversity ($F(1, 77) = 17.31$, $p < .01$, $\eta^2 = 0.18$). There were significant differences between the homogeneous and culturally diverse dyads under the low rather than high task specificity condition. The culturally diverse dyads performed significantly lower than the homogeneous teams under the low task specificity condition but not under the high task specificity condition.

Individual survey responses regarding group process variables were aggregated to the dyad level. (The median r_{wg} values of the 86 dyads were .93 for cooperation and .99 for conflict.)

A moderated mediation (Hypothesis 4). We utilized Edwards and Lambert's (2007) moderated mediation testing procedure to test Hypothesis 4. Hypothesis 4 was partially supported. Specifically, the results indicated that the negative indirect effect of cultural diversity on performance, via cooperation, was significantly stronger ($p < .05$) when task specificity was low (indirect effect = −0.19, 95% CI [−0.53, −0.02]) rather than high (indirect effect = 0.05, 95% CI [−0.08, 0.30]). Conflict did not mediate the relationship between cultural diversity and performance under either low (indirect effect = −0.06, 95% CI [−0.50, 0.05]) or high (indirect effect = −0.02, 95% CI [−0.25, 0.05]) task specificity.

Study 1: Discussion

Although the effect of team diversity on team processes and team performance has been widely examined, situational strength has largely been ignored. The current study examined the moderating effect of situational strength in the form of task specificity on the indirect effect of cultural diversity on team "execute" task performance, via team processes of cooperation and conflict. We found that culturally heterogeneous dyads under the low task specificity condition were significantly less cooperative, experienced significantly higher conflict, and performed worse than homogeneous dyads under low task specificity. However, no significant differences were found between the culturally homogeneous and heterogeneous dyads when working under the high task specificity condition. Our findings suggest that specifying and clarifying the task requirements helps overcome the negative impact of team cultural diversity on team processes and team execute task performance. The high task specificity condition represents a strong situation, enabling culturally diverse teams to use situational cues as guidelines for their actions, and therefore, no differences in team processes and outcomes were found. However, under the weak situation of non-specific task requirements, culturally diverse team members had difficulties cooperating and overcoming conflict. As a result, culturally diverse teams performed poorer than culturally homogeneous teams. This finding supports previous research proposing that situational strength is the most important situational moderator of the relationship between individual and cultural differences and task performance (Snyder & Ickes, 1985).

Study 2: Effects of Team Cultural Diversity and Situational Strength on Generate Task Performance

Study 2 focuses on culturally heterogeneous versus homogeneous dyads when performing a generate creative task, under high and low task specificity. Similar to Study 1, Study 2 tests for the moderating effect of task specificity on the mediating effect of team processes on the relationship between team cultural diversity and team performance outcomes as measured by creative performance rather than by performance accuracy.

In addition, looking at Studies 1 and 2 together, we will test for a three-way interaction of task type (i.e., Study 1—execute task and Study 2—generate creative task) and task specificity on the relationship between team cultural diversity and team performance outcomes.

Creativity in multicultural teams

A multi-level study revealed that working in a demographically diverse team (in terms of gender or hierarchical status, e.g., co-worker vs. supervisor) hampers creativity (Choi, 2007). This finding may also apply to culturally diverse teams. Studies showed that stressful conditions such as interacting with a member of a different culture reduced individuals' creative problem solving (Schultz & Searleman, 1998), lowered cognitive complexity and flexibility (De Dreu & Nijstad, 2008), and resulted in less creative task performance (Baer & Oldham, 2006).

Although culturally diverse teams can potentially be creative by virtue of using a large and diverse pool of resources, they may need more time and have to exert more effort than culturally homogeneous teams to learn how to work together (Gibson & Vermeulen, 2003). Another obstacle to realization of multicultural team potential is the tendency of group members to focus on information or knowledge that they have in common, rather than fully utilizing their range of unique ideas (Stewart & Stasser, 1995). Team members want to avoid confrontation and misunderstanding, receive their partners' approbation, and stay within a psychologically safe zone (West, 2002). The lack of a common cultural background increases individuals' reluctance to express and use unique ideas; they tend to focus on common ideas that would readily be accepted by others. We, therefore, hypothesize the following:

> *Hypothesis 5*: Cultural diversity will impede team creativity such that homogeneous dyads will be more creative than will heterogeneous dyads.

Situational strength and creativity

Amabile and her colleagues (e.g., Hill & Amabile, 1993) emphasized factors such as freedom of choice or autonomy, challenge, and support as critical for intrinsic motivation and creative accomplishment. Research supports the relationship between tolerance for ambiguity and creativity. For example, high tolerance for ambiguity is associated with risk taking, tolerance for mistakes, and low bureaucracy, which encourage exploration and novel ideas (Erez & Nouri, 2010; Miron-Spektor et al., 2011). In addition, one may produce unusual ideas if one is permitted to do so by the situation or by explicit instructions (Yuan & Woodman, 2010).

Explicit instructions, however, have a deleterious side. In divergent tasks, for example, structure and instructions specifying what needs to be done and how to do it reduce exploration and consequently attenuate individuals' opportunity to think creatively. Performance of creative divergent tasks will, thus, benefit from weak situations that allow higher levels of exploration as opposed to strong situations. We hypothesize the following:

> *Hypothesis 6*: Low task specificity will lead to a higher level of creativity than will high task specificity.

Cultural diversity and team processes

The lack of a shared meaning system in culturally diverse teams requires team members to elaborate their ideas in detail, attenuating the fluency of idea generation, as compared with homogeneous dyads. The decrease in fluency further abates the originality of ideas, as shown in a recent meta-analysis (Nijstad, De Dreu, Rietzschel, & Baas, 2010).

Nevertheless, although cultural heterogeneity increases team conflict and reduces team members' cooperation (Levine & Thompson, 1996), in performing generate tasks, which do not require agreement on one particular way of performing a task (Straus & McGrath, 1994), one can expect similar high levels of cooperation and low levels of conflict in homogeneous and heterogeneous teams. This phenomenon means that team processes do not account for the potentially negative effect of cultural diversity on team creativity. Rather, differences in communication patterns among heterogeneous teams compared with homogeneous teams may account for the low level of creativity in cultural heterogeneous versus homogeneous teams. Heterogeneous teams suffer from difficulties in relating to each other's ideas in the absence of a shared meaning system (Choi, 2007; Gibson & Gibbs, 2006). Consequently, heterogeneous teams suffer from less fluent communication and require more effort by members to clarify their ideas to avoid misunderstandings (Larkey, 1996). Therefore, they go into detail more than homogeneous teams, shifting the focus from generating more original ideas to justifying their ideas. Therefore, we hypothesize the following:

Hypothesis 7: Heterogeneous dyads will communicate more clarification messages, which will attenuate their fluency and originality, as compared with culturally homogeneous dyads.

Situational strength as a moderator of the relationship between team cultural diversity and creativity

Weak situations of low task specificity place few external constraints on individuals, enabling a wide range of behavioral responses and leaving room for individual discretion (Mischel, 1973). When performing generate creative tasks under weak situations of low task specificity, members of culturally diverse teams will be more at ease in generating and sharing their ideas than under strong situations, which constrain the free flow of associations and dictate expected responses (Mischel, 1973). In contrast, high task specificity constrains the free flow of ideas and limits the variance in ideas that could be generated by members with a diverse pool of resources. Adding the moderating effect of task specificity on the relationship between cultural diversity and team performance, to Hypothesis 7 on the mediating effect of communication clarifications on the relationship between cultural diversity and team performance of generate tasks, we hypothesize the following:

Hypothesis 8: Task specificity will moderate the mediating effect of team communication clarifications on the relationship between team cultural diversity and team creativity, such that the mediating effect will be stronger under high rather than low task specificity.

Model 2 illustrates the four hypotheses of Study 2 on a generate task (Figure 1).

Looking at Studies 1 and 2 together, we propose an interaction effect between task specificity, task type, and team cultural diversity, as suggested in Hypothesis 2 of study 1, and in Hypothesis 6 of study 2. Team cultural diversity leads to a higher performance level when performing a convergent execute task under high rather than low task specificity. In contrast, team cultural diversity leads to higher performance outcomes when performing a generate creative task under low, rather than high task specificity. It is crucial for culturally diverse teams performing an execute task to interpret task requirements in the same way, which will increase cooperation and coordination, rather than when performing a generate task, which enables diverse ideas that build upon the cultural diversity of the team members to emerge. Hence, we hypothesize the following:

Hypothesis 9: There will be a three-way interaction of cultural diversity, task specificity, and task type, such that in an execute task, performance will be higher under high rather than low task specificity. In contrast, in a generate creative task, performance will be higher under low rather than high task specificity. These interaction effects will be attenuated among culturally homogeneous dyads compared with culturally heterogeneous dyads.

Study 2: Methods

Study 2 replicated the same procedure, manipulations, and design and implemented them on a divergent generate task.

Participants

Ninety-six dyads (two-person work teams) of undergraduate students participated in the Study 2 experiment. The mean age of the participants was 23.71 years ($SD = 2.35$ years). Forty-eight percent (48 percent) of the participants were female, and 52 percent were male.

Students came from a variety of functional backgrounds such as biotechnology (2.5 percent), business (7.6 percent), computer science (3.6 percent), economics (8.6 percent), electrical and electronic engineering (10.2 percent), industrial engineering and management (31.5 percent), information engineering (9.1 percent), materials engineering (3.6 percent), and mechanical and production engineering (4.6 percent). Just as in Study 1, we recruited only ethnic Chinese

students as participants in the Singaporean sample, given the overwhelming dominance of ethnic Chinese in the University population.

A generate creative task

This task required participants to generate as many interpretations as possible of two symbols. One symbol, yin-yang, represents the Chinese culture; and the other symbol, the Star of David, represents the Jewish culture. Each symbol consisted of two shapes. Dyad members were asked to take turns during their idea-generation phase. If one of them became stuck, the other was permitted to make a suggestion. Participants had 10 minutes to work on the task and generate as many different interpretations as possible regarding the two symbols presented to them.

Situational strength manipulation. The same two shapes of each figure appeared under the strong and weak task specificity conditions but in different compositions. Under the high task clarity and specificity condition, the two shapes of each figure represented one meaningful symbol, that of the yin-yang and that of the Star of David. Under the weak task specificity condition, the two shapes of each symbol appeared separately from each other and did not compose one meaningful symbol, as shown in Figure 2. Furthermore, under the high task specificity condition, additional instructions were given (i.e., You may change the location of the shapes in each figure relative to the other and you may combine them in various different forms.) The structured symbol and the specific instructions under the strong task condition reduced uncertainty and ambiguity in comparison with the weak task condition.

Measures

Manipulation check. Situational strength manipulation was assessed with a four-item scale developed by the researchers for the purpose of the current study (i.e., "I received specific instructions on how to carry out this task"), using a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). Cronbach's α was .83.

Task creative performance. Participants generated interpretations of the yin-yang symbol and the Star of David interchangeably under the same task. We summed the ideas generated for each symbol, resulting in a total of 2340 ideas.

Two independent judges from Israel and Singapore evaluated creativity fluency and originality using a coding system based on Torrance (1974) and Silvia et al. (2008). In the first step of the evaluation process, all 2340 responses were mixed together regardless of the experimental conditions in which they were generated. Thereafter, we generated the categories to be used by the judges for classifying the responses, on the basis of the semantic meaning of the different responses. Responses with the same semantic meaning belonged to the same category.

Twenty categories with different semantic meanings were identified for each icon. For example, the category of "geometrical shape" included words such as triangle, pentagon, and hexagon, used in the descriptions of the Star of David, and words such as circles or curved line, used to describe the yin-yang. Responses that did not fit into any of the 20 semantic categories, but were meaningful, were classified under "other," for example, "flying carpet." Responses that were considered to be inappropriate or bizarre by the judges were classified under "weird," for example, "a = standing, don't ask why." Altogether, 22 categories emerged for each icon (20 semantic categories, weird and other). The independent judges received for each icon a typology of 22 categories and were asked to sort each response into one category only.

Two criteria served for evaluating the level of creativity of the responses: fluency, assessed by the total number of responses per dyad as counted by the independent judges, and originality, assessed by responses classified into a category that appeared in no more than 10 percent of the dyads. Also, responses under the category of other were considered to be original because they were rare and did not fit into any of the 20 semantic categories. Each response received one point for originality. The total score of originality was calculated as the ratio between the total originality points per dyad divided by the total number of responses per dyad. Responses classified as weird category were not included in the originality measure.

The level of agreement between the two judges from Israel and Singapore was acceptable (fluency: ICC $(3,2) = .96$, $p < .002$; originality $ICC(3,2) = .82$, $p < .004$). The scores of fluency and originality were standardized to enable comparability between fluency, originality, and the accuracy measure from Study 1.

Communication text analysis. We assessed communication clarifications among team members by documenting members' written communication during their task performance using Microsoft's instant messaging program—MSN. Each member wrote a sentence and pressed "Enter" to send it to his or her partner. Each sentence during the conversation is defined as an instant message (IM).

UNIX script served for the text analysis of the IM communication between the two members of each dyad. We measured the total number of IMs each dyad used (*number of IM*), as well as the average length of each IM, in terms of the total number of characters and spaces (*Avg. Length of IM*). A higher *Avg. Length of IM* indicates a higher level of clarification.

Group processes. Cooperation and conflict were measured as in Study 1. Cronbach's α was .93 for cooperation and .89 for conflict.

Control variables. We included the same control variables as in Study 1, with the exception of functional diversity, which was not included in Study 2. Cronbach's α for team members' CQ was .93.

In addition to the control variables of English proficiency, age diversity, and gender diversity, in Study 2, we also measured team members' average level of individual creativity using the Torrance Circle Test of Creative Thinking. We coded the responses in accordance with Torrance test guidelines (Torrance, 1974).

Study 2: Results

Descriptive statistics
The means, *SD*s, and the inter-correlations among all team-level variables appear in Table 2. Task specificity negatively and significantly correlated with originality ($r = -.47$, $p < .01$), but not with fluency ($r = -.01$, *ns*). Task specificity did not correlate with any group process variable. Cultural diversity negatively and significantly correlated with team creative task performance (fluency: $r = -.28$, $p < .01$; originality: $r = -.22$, $p < .05$) and negatively and significantly correlated with number of IMs ($r = -.23$, $p < .01$), but not with the group process variables.

Manipulation check
Results of the manipulation check revealed a significant main effect of the situation strength manipulation on the level of ambiguity of the symbol ($t(95) = -8.32$, $p < .01$), indicating that dyads under the weak condition perceived the symbols as more ambiguous ($M = 3.98$, $SD = 1.07$) than dyads under the strong condition ($M = 5.64$, $SD = 0.89$).

Furthermore, a significant main effect was found for instructions ($t(94) = -2.71$, $p < .01$), indicating that dyads under the low task specificity condition perceived the task instructions to be less specific ($M = 4.33$, $SD = 1.04$) than dyads under the high task specificity condition ($M = 4.90$, $SD = 1.54$).

Hypothesis testing
Effects of cultural diversity on team creativity (Hypothesis 5). Hypothesis 5 was supported. Controlling for team members' average individual creativity, CQ, and English proficiency, as well as teams' age diversity and gender diversity, ANCOVA indicated, as expected, that cultural diversity reduced team creativity for both fluency ($F(1, 87) = 4.29$, $p < .05$, $\eta^2 = 0.05$) and originality ($F(1, 87) = 4.29$, $p < .05$, $\eta^2 = 0.05$).

Group process variables were aggregated to the dyad level (median r_{wg} value of the 96 dyads was .93 for cooperation and .98 for conflict). Negative group processes could not explain the negative effect of cultural diversity on team

Table 2. Descriptive statistics and correlations of team-level variables (Study 2).

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
Dependent variable														
1. Fluency	0.00	1.00												
2. Originality	0.00	1.00	.21*											
Mediating variables														
3. Cooperation	6.16	0.71	.14	.11										
4. Conflict	1.59	0.57	.04	.02	−.35**									
5. Number of IMs[a]	40.24	15.38	.55**	.17	.18	.08								
6. Average length of IM[a]	17.59	5.68	−.49**	−.23*	.01	.05	−.43**							
Independent variables														
7. Cultural diversity (0=*no*, 1=*yes*)	0.52	0.50	−.28**	−.22*	−.10	.00	−.23*	.20						
8. Task specificity (0=*low*, 1=*high*)	0.50	0.50	−.01	−.47**	−.13	.07	−.14	.14	.00					
Control variables														
9. Team members' individual creativity	10.65	3.39	.22*	.16	.09	.18	.24*	.06	−.12	.10				
10. Team members' cultural intelligence	4.77	0.62	.14	−.02	.34**	−.09	−.06	.08	−.16	−.05	.12			
11. Team members' English proficiency	4.62	0.69	.04	−.20*	.26**	−.30**	−.06	.17	−.03	.04	.03	.37**		
12. Age diversity	1.85	1.54	−.02	.08	−.22*	.03	−.08	−.11	−.10	−.10	−.14	−.20	−.24*	
13. Gender diversity (0=*no*, 1=*yes*)	0.57	0.50	.13	.22*	.00	.05	.00	−.09	−.32**	−.11	.00	.09	−.20*	.09

Note: *N*=96 teams. Fluency and originality are reported as standardized mean scores. IM=instant message.
[a]*N*=90 teams.
*p < .05; **p < .01.

creativity as there were no significant differences between heterogeneous and homogeneous dyads in the group process measures of conflict and cooperation.

Effects of task specificity and clarity on team creativity (Hypothesis 6). Hypothesis 6 was partially supported. Controlling for team members' average individual creativity, CQ, English proficiency, age diversity, and gender diversity, ANCOVA demonstrated that the level of creativity was higher under the low task specificity as opposed to the high task specificity condition for the originality measure ($F(1, 87) = 24.87$, $p < .01$, $\eta^2 = 0.22$), but not for fluency ($F(1, 87) = .04$, *ns*, $\eta^2 = 0.00$).

There was no significant interaction effect of cultural diversity and situational strength on creativity. Both homogeneous and heterogeneous dyads were more creative under the low task specificity condition. Furthermore, there were no significant differences between the high and low task specificity conditions in the group process measures.

Communication clarifications as a mediator (Hypothesis 7). Text analysis of dyads' conversations served for testing Hypothesis 7. Using UNIX script for text analyses of the IMs generated two scores: the *number of IM*s per dyad and the average length of each IM, *Avg. Length of IM* (in terms of total number of characters and spaces).

Controlling for team members' average individual creativity, CQ, English proficiency, age diversity, and gender diversity, ANCOVA demonstrated that cultural diversity reduced the number of IMs ($F(1, 81) = 5.92$, $p < .05$, $\eta^2 = 0.07$). Homogeneous dyads sent significantly more messages ($M = 43.77$, $SD = 16.85$) than did heterogeneous dyads ($M = 36.87$, $SD = 13.13$). The average length of IMs was marginally longer ($F(1, 81) = 3.93$, $p < .06$, $\eta^2 = 0.05$) for heterogeneous ($M = 18.70$, $SD = 5.91$) compared with homogeneous ($M = 16.43$, $SD = 5.23$) dyads. There were no interaction effects between cultural diversity and task specificity.

Whereas most responses of homogeneous dyads were very short and focused, responses of heterogeneous dyads were longer and cumbersome. The majority of sentences with more than 50 characters (about 60 percent) appeared in the heterogeneous dyads.

Hypothesis 7, regarding the mediating effects of number and average length of IM on the relationship between cultural diversity and creativity, was partially supported. Using Preacher and Hayes's (2008) procedures for testing multiple mediators, and controlling for team members' average individual creativity, CQ, English proficiency, age diversity, and gender diversity, results indicated that the number of IMs mediated the negative relationship between cultural diversity and fluency (indirect effect = −0.20, 95% CI [−0.43, −0.02]), but the average length of IMs did not mediate this relationship (indirect effect = −0.17, 95% CI [−0.38, 0.00]). Neither number of IMs (indirect effect = −0.03, 95% CI [−0.17, 0.08]) nor average length of IM (indirect effect = −0.05, 95% CI [−0.20, 0.04]) mediated the relationship between cultural diversity and originality.

A *t*-test for independent samples revealed that there were no significant differences between homogeneous Israeli dyads and homogeneous Singaporeans dyads in the number of IMs ($t(43) = 1.43$, *ns*), in the length of IMs ($t(43) = 0.72$, *ns*) or in the individual creativity test ($t(191) = 0.91$, *ns*).

A moderated mediation (Hypothesis 8). Hypothesis 8 proposed that the mediating effect of team communication clarifications on the relationship between team cultural diversity and team creativity will be stronger under high rather than low task specificity. We tested Hypothesis 8 using Edwards and Lambert's (2007) moderated mediation procedure.

Results indicated that the negative indirect effect of cultural diversity on *fluency* via number of IM was significant when task specificity was low (indirect effect = −0.39, 95% CI [−0.98, −0.15]) but not when task specificity was high (indirect effect = −0.17, 95% CI [−0.78, 0.17]). By contrast, the negative indirect effect of cultural diversity on *fluency* via length of IM was significant when task specificity was high (indirect effect = −0.37, 95% CI [−0.89, −0.02]) but not when task specificity was low (indirect effect = −0.14, 95% CI [−0.51, 0.18]). However, the difference in the strength of the mediating effects between the high and low task specificity conditions failed to reach statistical significance for both number and length of IM. Thus, Hypothesis 8 is not supported for *fluency*.

Number of IMs did not mediate the negative effect of cultural diversity on *originality*—both when task specificity was low (indirect effect = 0.00, 95% CI [−0.36, 0.19]) and when task specificity was high (indirect effect = 0.00, 95% CI [−0.22, 0.08]). Similarly, length of IM did not mediate the negative effect of cultural diversity on *originality* under both low (indirect effect = −0.02, 95% CI [−0.33, 0.12]) and high (indirect effect = 0.03, 95% CI [−0.18, 0.14]) task specificity. Hence, Hypothesis 8 is not supported for *originality*.

Three-way interaction of cultural diversity, task specificity, and task type (Hypothesis 9). To test Hypothesis 9, we combined the data sets of Studies 1 and 2. We conducted a three-way ANOVA analysis to test for the interaction between cultural diversity, task specificity, and task type ($F(1, 174) = 14.29$, $p < .01$, $\eta^2 = 0.08$). The results fully supported Hypothesis 9, as illustrated in Figure 3. Namely in the execute task, performance was higher under high task specificity rather than low task specificity. In contrast, in the generate creative task, performance was higher under low task specificity rather than high task specificity. These interaction effects were attenuated among culturally homogeneous dyads compared with culturally heterogeneous dyads.
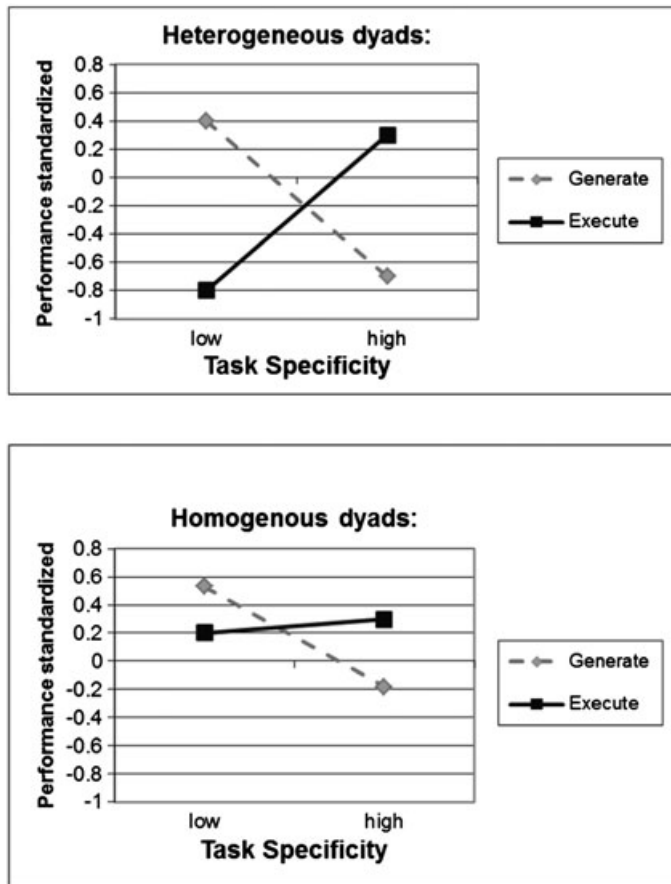

Figure 3. Three-way interaction of performance (accuracy/creativity) as predicted by cultural diversity, task specificity, and task type

Study 2: Discussion

Study 2 contributes to resolving the debate between the two competing theories: information/decision making (Easely, 2001), which asserts that diversity increases team creativity, and social categorization (Tajfel, 1978; Turner, 1987), which proposes that team diversity hinders creativity because of lack of similarity, lack of a shared meaning system, and social categorization (Choi, 2007; Gibson & Gibbs, 2006; Van Knippenberg & Schippers, 2007). The present study identified two major factors that reconcile the inconsistency between the two approaches.

First, we identified task specificity as an important explanatory factor of team creativity. Both cultural homogeneous (only Israelis and only Singaporeans) and heterogeneous teams demonstrated a higher level of originality under low rather than high task specificity, and there was no significant difference in the level of originality between homogeneous and heterogeneous teams under the low task specificity condition. This finding may suggest that implementing a weak situation in the form of low task specificity facilitates team creativity even in tight cultures such as Singapore (Gelfand et al., 2011). A weak situation with no specific and clear guidance or constraints facilitates exploration, enabling the free flow of associative thinking, as shown by the relatively high level of originality experienced by all dyads under weak situations rather than strong situations. Yet task specificity had no effect on team fluency. This finding means that under high task specificity, the dyads generated the same amount of ideas, but their ideas were more conventional than those generated under low task specificity.

Second, we discovered the importance of the communication pattern among the dyad members, and using text analysis, we identified the differences in communication between homogeneous and heterogeneous teams. When task specificity was high, heterogeneous dyad communication messages were significantly longer than homogeneous dyads, suggesting the former group's need to elaborate on, explain, and justify their ideas. Yet when task specificity was low, the average length of communication did not significantly differ between heterogeneous and homogeneous dyads. This finding suggests that when task structure was weak, it enabled heterogeneous dyads to more freely generate and share their ideas. However, the moderated mediation model was not supported for fluency or for originality. More research is needed to further understand the effect of communication on the relationship between cultural diversity and team creative performance.

General Discussion

The present research uncovers some of the existing barriers for understanding the effects of team diversity on team performance. *First*, our theoretical model proposes that moderating and mediating effects should be examined in order to fully understand the effect of cultural diversity on team performance outcomes. We proposed a moderated mediation model, with task specificity and task type as the moderating variables and team processes, including cooperation, conflict, and communication type as the mediating variables. By taking this approach, this research overcomes the limited understanding offered by looking at main effects only, as suggested by Van Knippenberg and Schippers (2007).

Second, this research brings into focus the important role played by context in explaining the effect of team diversity on team performance. Contextual effects have largely been ignored when testing for the effect of cultural diversity on performance (Van Knippenberg & Schippers, 2007). We theorized that situational strength is of particular importance in understanding the effect of team cultural diversity on performance because it can either attenuate or magnify cultural differences. In this study, a strong situation, conveyed by high task specificity, attenuated cultural differences because the situation itself provided strong cues that elicited similar responses by members of different cultures. By contrast, a weak situation, conveyed by low specificity, magnified cultural differences because members of different cultures used their own cultural values and norms for interpreting and responding to the situation. We used task specificity to represent situational strength. We referred to two task characteristics as enhancing or attenuating the display of cultural differences in response to the task cues, namely (i) the instructions

for performing the task, whether highly specific or general, and (ii) the cues provided by the task itself, either clear or ambiguous. The task conveyed high specificity when both task instructions and task cues were clear and specific. In contrast, the task conveyed low specificity when both task instructions and task cues were unclear and ambiguous.

Third, we asked the question of what task type benefits from a diverse pool of knowledge and perspectives, characteristic of culturally diverse teams, and what task type benefits from similarity in knowledge and cultural experiences, characteristic of culturally homogeneous teams. We introduced task type using McGrath's (1984) task type circumplex model to differentiate between execute and generate tasks.

Fourth, we integrated the two theories of situation strength and task type to reflect the task context. Then we proposed that cultural diversity had different effects on team performance outcomes under the combination of these two situational factors. Team cultural diversity had a positive effect on the performance of execute tasks under high task specificity conditions and a positive effect on the performance of generate creative tasks under low task specificity conditions.

Fifth, we explained the relationship between team diversity and team performance by the mediating effect of team processes. In the execute task, we focused on team conflict and team cooperation because these two variables are relevant when task interdependence is high, and team members need to coordinate their activities to perform the task. We focused on the communication exchange pattern in the generate creative task to test whether elaboration on the generated ideas in the form of the intensity of communication, as measured by the number of communication scripts, and the depth of communication, as measured by the number of words used to elaborate on the ideas, differed for culturally heterogeneous versus homogeneous teams. We hypothesized that the intensity and depth of communication would be higher in culturally heterogeneous teams rather than in homogeneous teams.

Our research hypotheses were partially supported. In line with social categorization theory, we found that the performance outcomes of culturally diverse teams were lower than those of homogeneous teams for both the execute and creative tasks. Furthermore, we did not identify any condition in which culturally diverse teams outperformed the homogeneous teams. However, we found a significant effect of situational strength on team performance. Culturally diverse teams were more sensitive to situational effects than homogeneous teams when performing the execute task.

Situational strength moderated the effect of cultural diversity on team performance, with opposing effects on the execute task versus the generate creative task. High task specificity enhanced the execute task performance of culturally diverse teams as compared with low task specificity, and it attenuated the differences between homogeneous and heterogeneous teams under high, rather than low task specificity conditions. However, for the creative task, high task specificity attenuated the level of creativity of both homogeneous and heterogeneous teams, as compared with low task specificity; and there was no significant interaction effect of cultural diversity by situational strength on creative task performance.

Our study demonstrated that to further understand the performance of culturally diverse teams, we need to identify the conditions that either attenuate cultural differences to the benefit of the task, as in the execute task, or magnify the cultural diversity to the benefit of the creative task. Our findings support the theories advocating the importance of task specificity (Kirkpatrick & Locke, 1996) by demonstrating the positive effect of high task specificity on the performance of execute tasks by culturally heterogeneous teams and the positive effect of low task specificity on the performance of a creative task. These findings support theories of creative performance, which advocate low constraints and high task autonomy for enhancing creative task performance (Amabile, 1996; Hill & Amabile, 1993), and this is true for both culturally homogeneous and heterogeneous teams. Hence, our research extends the two theories of situational strength and task type and proposes that the combination of these two theories further increases the predictability of performance of culturally diverse teams.

The two studies aimed to elucidate the differences between homogeneous and heterogeneous teams by examining team processes that emerge in response to cultural diversity under varying task specificity conditions. When performing the execute tasks, low task specificity as opposed to high task specificity increased the negative indirect effect of cultural diversity on team performance via its negative effect on team cooperation. This finding stresses the importance of

cooperation between team members when performing an execute task, as proposed by McGrath (McGrath, 1984; Argote & McGrath, 1993). When performing the creative task in Study 2, the two team processes of conflict and cooperation did not mediate the effect of team cultural diversity on creative performance, because in line with McGrath's model, the creative task did not require a high level of cooperation on the way to reaching one correct response, as in the case of the execute task. Yet the type of communication in terms of the intensity and depth of communication varied between culturally homogeneous and heterogeneous teams. The average length of IMs increased for culturally diverse teams, reflecting their need for more in-depth elaboration in contrast to that required by homogeneous teams. Yet the number of IMs decreased for culturally heterogeneous teams. This effect specifically mediated the negative relationship between cultural diversity and fluency but not between cultural diversity and originality. This finding suggests that culturally diverse teams may experience process loss because of extensive elaboration, resulting in a lower number of generated ideas. However, these effects were not moderated by task specificity, suggesting that participants under both high and low task specificity felt the need to elaborate on their ideas. We suggest that the effect of team diversity was more dominant on the patterns of communication than the effect of task specificity when performing the creative task, motivating members of heterogeneous teams to elaborate more than members of homogeneous teams.

Limitations and future research

The two experiments highlighted the complexity of the relationship between team cultural diversity and team performance. Not all our research hypotheses were supported, suggesting that more research is needed to fully understand the mediating and moderating effects on the relationship between cultural diversity and team performance. Understanding such effects will enable, in the future, the design of work contexts that facilitate the successful performance of such teams on a variety of tasks. A recent research on collective intelligence (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010) demonstrated that gender diversity enhances team collective intelligence and team performance. Therefore, more research efforts should be directed to understanding the conditions that facilitate the success of culturally diverse teams.

Our current research reveals that weak situations magnify cultural differences among team members. Future research should examine whether individual differences such as CQ (Imai & Gelfand, 2010; Rockstuhl, Seiler, Ang, Van Dyne, & Annen, 2011) could mitigate process losses of teams and enhance team performance in such weak situations. Our study also showed homogeneous teams outperforming heterogeneous teams on creative tasks. Future research could explore the extent to which CQ mitigates creative process losses of heterogeneous teams.

One possible limitation of the current study may be the language used for communication. Specifically, the homogeneous Singaporeans communicated in English, whereas the homogeneous Israelis communicated in Hebrew, and the heterogeneous dyads also communicated in English. We believe this has a high external validity as these are the official and spoken languages in Singapore and Israel, respectively, and English is the common global language used for communication in culturally diverse teams. Moreover, language proficiency had no effects on the result. Still, future research should address the language proficiency issue by, for example, juxtaposing homogeneous and heterogeneous dyads from countries that have the same spoken language versus those that have different spoken languages (Neeley, 2012).

Additionally, the differences in the level of originality between the high and low task specificity conditions may also be explained by the specific task that uses cultural symbols under the high specificity condition, bringing into salience social categorization, which impedes team creativity. Future research should test whether the task itself can neutralize or prime the cultural factor, which impedes team creativity.

In the current study, dyads collaborated on ad hoc tasks. Future research should address long-term collaboration (Wildman et al., 2012) and larger teams. Furthermore, Joshi and Roh (2009) in their meta-analysis proposed that the balance among the culturally diverse members, whether of equal or unequal proportion, should be considered when studying the effect of team diversity on team outcomes. Finally, Miron-Spektor et al. (2011) demonstrated that

certain proportions of team members having the cognitive styles of creativity breakthrough versus attention-to-detail and conformity influence the level of team innovation. Hence, future research should test for the effect of the variance in cognitive styles and not only in the culture of origin on team creative performance.

Conclusions and practical implications

This research has important practical implications. First, it underscores the importance of matching the task type to the task specificity or situational strength. Culturally diverse teams benefit from specific task instructions when working on an execute task, and they benefit from general task instructions when performing a creative task. Second, we showed that cultural diversity is not very crucial under strong situations because the situation itself dictates the preferred behavior. Cultural diversity becomes crucial for team performance under general and ill-defined tasks. Third, team processes are crucial for tasks that require coordination and cooperation, but they may be less crucial for tasks with a low level of interdependence and a high level of autonomy. Fourth, global organizations often require team cooperation across culturally diverse and geographically dispersed sites. In this case, it is recommended to form teams within sites rather than across sites for executing tasks and to attenuate the level of interdependence and the need to closely coordinate across sites. Taking together the research findings of this study, we also recommend uniting multicultural team members around a joint goal, which helps structure the situation, reduce the level of ambiguity and potential conflict, and increases the level of cooperation towards accomplishment of the joint goal.

To sum, this research contributed to the research knowledge on team cultural diversity by identifying the moderating role played by task type and task specificity. Offering specific task instructions for performing an execute task positively influenced team processes of cooperation and low conflict, which mediated the positive effect of team cultural diversity on team performance. However, these positive effects were not found under the low task specificity condition.

Furthermore, when performing a generate creativity task, all teams, including culturally homogeneous and heterogeneous teams, were more creative under low rather than high task specificity, and this relationship was not mediated by team processes of cooperation and conflict. Yet low task specificity led multicultural teams to elaborate on their ideas more than homogeneous teams. Recognizing the power of situational strength as it interacts with the task type will enable managers to create the context that is most supportive of multicultural team effectiveness.

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