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Recognition of Expertise and Perceived Influence in Intercultural Collaboration: A Study of Mixed American and Chinese Groups

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Building on tenets from transactive memory (TM) theory and expectation states (ES) theory, this study examined how communication styles influenced expertise recognition and perceived influence in intercultural groups of Chinese and American members. Controlling for the impact of actual expertise, we found that confident communication did not affect expertise recognition, but affected perceived influence; task-oriented communication had significant positive impact on both expertise recognition and perceived influence; and finally, talkativeness and dominance did not predict either expertise recognition or perceived influence. These results highlight the importance of shared ES, which people from different cultures may not develop, in expertise recognition and influence inferred from a group interaction, thus, contributing to understanding the role of culture and communication in TM development.

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Much of the expertise needed to meet organizational objectives resides in groups with heterogeneous levels and types of expertise. As a result, members of effective work groups need to be able to communicate among themselves in ways that allow them to (a) recognize the expertise of different members, and (b) channel influence on decisions and tasks to those with the relevant expertise (Bunderson, 2003; Palazzolo, Serb, She, Su, & Contractor, 2006). Communication to share and apply expertise can be challenging for groups due to many factors such as difficult personalities (e.g., Casciaro & Lobo, 2005), negative interpersonal affect (Yuan, Carboni, & Ehrlich, 2010a), geographic separation (Hollingshead, Fulk, & Monge, 2002), technological mediation (Gibson & Gibbs, 2006), or lack of strong network

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ties (Yuan, Fulk, Monge, & Contractor, 2010), among many others. Communicating expertise can be doubly difficult for multicultural groups due to cultural stereotypes and intercultural miscommunication (Yoon & Hollingshead, 2010). As multicultural groups become more common for organizations in today's global economy, research on communication to share expertise in such teams is increasingly critical (Earley & Gibson, 2002). The research reported here addresses this need by examining communication styles that may influence expertise recognition in multicultural groups.

At least two streams of communication-related theory and research are highly relevant to the challenges of communication for expertise recognition and subsequent influence: (a) transactive memory (TM) theory (Hollingshead, 1998; Wegner, 1987; Yuan, Carboni, & Ehrlich, 2010b; Yuan, Fulk, et al., 2010), and (b) a research program that draws on expectation states (ES) theory (Berger, Wagner, & Zelditch, 1985; Bonito, 2003a) to study communicating expert influence in small groups (e.g., Littlepage, Schmidt, Whisler, & Frost, 1995). TM theory argues that coordinated utilization of a group's collective knowledge requires that group members (a) develop heterogeneous types and levels of specialized expertise needed to complete tasks, (b) accurately recognize each other's expertise, and (c) communicate effectively to share expertise across team members as needed. As Hollingshead, Gupta, Yoon, & Brandon (2011) noted:

> In a sense, the term transactive ''memory'' is a misnomer, because it is about more than learning, storing, and remembering information; it is also about knowledge transmission and knowledge generation, which involve communication (p. 429).

Communication research has demonstrated that effective expertise recognition is related to knowledge sharing in groups (Yuan, Fulk, & Monge, 2007; Yuan et al., 2010). Extensive research in both communication and management fields also has demonstrated that groups who have effective TM systems characterized by specialization, coordination, and credibility of expertise tend to perform better and make more effective decisions than groups without such systems (see Ren & Argote, 2011, and Hollingshead, Gupta, et al., 2011, for reviews). There is a dearth of research, however, on the processes through which groups come to develop the expertise perceptions that are so critical in achieving these outcomes. Thus, one contribution of this work to the TM tradition is to examine communication styles as important antecedents of expertise perceptions. We do so by integrating ideas from ES theory (Berger et al., 1985), which focuses on the processes by which people arrive at judgments about others' expertise and the consequences of those judgments for an individual's influence in the group.

ES theory proposes that group members aggregate a variety of contextual cues to develop ES about others' status and competence. One source of ES is inference from observed communication behavior of others. ES studies using small, homogeneous

culture groups found that perceived confidence, dominance, talkativeness, and task-oriented communication outweighed actual expertise in influencing decision-making (Littlepage & Mueller, 1997; Littlepage et al., 1995). However, this finding has not been examined in small multicultural groups. Because findings from comparative studies of same-culture groups do not always apply to intercultural interactions (Levine, Park, & Kim, 2007), it is important to conduct research with culturally heterogeneous groups. Thus, a second contribution of the study reported here is to test whether the same pattern of results holds in intercultural collaboration, and whether members from cultures that historically value communication confidence, dominance, and talkativeness will sway intercultural decision-making regardless of their actual expertise, potentially hindering the development of effective TM systems.

In the following sections, we first present our arguments as to why communication styles matter for expertise recognition in the development of TM systems, and then use ES theory to explain how different interpretations of communication behaviors by members of different cultures can challenge the emergence of common ES due to differences in cultural assumptions. We examine these questions through an experimental study that involved collaboration between Chinese and American graduate students. We conclude with conceptual and practical implications of the results for intercultural collaboration in small groups.

TM theory and the role of communication styles in expertise recognition

TM theory (Wegner, 1987) describes how group members communicate to develop a specialized division of labor with respect to expertise and how they coordinate their expertise to achieve high group efficiency. Although specialization within a TM system means that group members do not need to have expertise outside their specialty, they do need to learn who has what specialty, the "who knows what" in the team. The mental maps of expertise location are often labeled expertise directories, and the theory proposes that they are developed through processes of communication involving a variety of activities including, for example, direct assertions of expertise, inference of expertise based upon credentials, social stereotyping based on diffuse status cues (e.g., age, race, or gender), or third-party judgments (Hollingshead, Brandon, Yoon, & Gupta, 2011). The accuracy and extensiveness of these directories are critical (Yuan et al., 2007) because they serve to structure communication through two processes. First, group members communicate incoming information to other group members who are seen as needing the information based upon both expertise assessments and task requirements. Second, group members seek task-related information from others who are seen as being expert in particular task-related areas. For example, in a software development team, expertise might be needed in the areas of requirements definition, design, architecture, coding, testing, project management, and client presentations. An expert in requirements definition might come across information related to architecture and communicate this information to the expert in that area. Similarly, a group member working on

coding may seek information from an expert on design in order to complete the coding task.

Extensive empirical research has confirmed that effective functioning of a TM system depends on accuracy of expertise recognition (for comprehensive reviews, refer to Hollingshead et al., 2011; Lewis & Herndon, 2011; Ren & Argote, 2011). However, much less attention has been given to factors that can influence the level of accuracy of expertise recognition. Among the few works that focus on antecedents, the emphasis has been placed on stereotyping based on race or gender. For instance, Hollinghead and Fraidin (2003) found that gender stereotypes influence expertise recognition, which, in turn, influences task assignment. Yoon and Hollingshead (2010) examined cultural stereotypes in dyadic TM for Asians and White Europeans, and found differential effects on attributions of expertise for diverse (one Asian and one White European) versus homogeneous (both Asian or both White European) cultural dyads. Compared to individuals in homogeneous culture dyads, each individual in diverse cultural dyads reported expertise levels for both self and partner that were more consistent with cultural stereotypes (e.g., Asians were seen to have higher math skills and White Europeans were seen to be more knowledgeable about sports). These results suggest that the dynamics in mixed-culture groups are likely to differ from those in same-culture groups, and that mixed-culture groups may be more likely to use cultural stereotypes in knowledge assessment compared to homogeneous culture groups. What has not yet been studied in TM research is how characteristics of actual communication processes (as opposed to categorical cues such as gender or race) influence expertise recognition in intercultural groups. This gap is addressed to some degree by research on communication styles and expertise recognition that draws on ES theory. In the following section, we overview the basic concepts of ES theory and describe a stream of research that uses ES theory to examine communication style as a predictor of expertise assessments. We then extend ES theory to intercultural groups to pose research questions about the role of communication variables in the development of the expertise perceptions that are foundational to TM systems.

Communication styles as status cues in ES theory

According to ES theory, social interactions provide abundant cues through which people develop expectations about competencies and potentials for task-related contributions for themselves and other persons (Berger et al., 1985). These performance expectations are "taken-for-granted beliefs about how likely it is that each group member will contribute to success at the task" (Kalkhoff & Thye, 2006, p. 220), which can affect performance evaluation and social influence in a group. For example, independent of actual performance, higher-status members tend to receive higher performance evaluations than lower-status members and have higher influence in the group (Berger, Webster, Ridgeway, & Rosenhotz, 1986). Group members develop these expectations based on culturally valued status cues, such as gender, age, race, demeanor, occupation, and education, among many others. Cultural framework is

important to performance expectations because status cues are socially constructed, as part of people's established and enduring cultural beliefs (Wagner & Berger, 2002). Thus, ES tends to converge in groups composed of members with a similar cultural background because they share common cultural beliefs about status cues.

Salient status cues can be classified into different categories along multiple dimensions (Berger et al., 1986; Wagner & Berger, 2002). The dimension most pertinent to task-related group interaction is the distinction between categorical cues and task cues. Categorical cues describe categories of people or their social characteristics (e.g., sex, age, ethnicity, occupation, or education). Thus, pre-existing social differences in the form of categorical cues can shape group members' ES even prior to group discussion, and accordingly most existing studies of ES theory focus on categorical cues. Task cues, in contrast, emerge in the immediate interaction, including task-relevant statements (''I'm a computer scientist'') and expressive cues emitted during interaction, for example, speech loudness or a confident tone of voice (Berger & Zelditch, 1998). Compared to research on categorical cues, much less ES research has addressed task cues, particularly expressive cues in the form of stylistic characteristics (see, for review, Kalkhoff & Thye, 2006). Even when the focus has been on communication behaviors, verbal or nonverbal expressions of expertise typically have not been studied in interacting groups, but manipulated through the use of a computer-programmed confederate (e.g., Ridgeway, Berger, & Smith, 1985).

Communication scholars are among the first to recognize that inattention to communicative interaction is a limitation of existing ES research. In a number of papers, Bonito (2001, 2003a, 2003b) argued for the importance of both the social categories and the communicative processes to participation and influence in small groups. He further criticized the ES approach for ''confounding social and communication-cognitive processes'' (2001, p. 277) because a group's status order based on social categories addresses ''the social issue of who gets to speak'' only; it does not address ''communicative aspects of participation,'' that is, what they say or when (2003a, p. 84). As Bonito's (2003a) study shows, group members' evaluations of each other are both heuristic and systematic: They not only rely on pre-existing social characteristics, but also evolve and are malleable based on their interaction behaviors and substantive contributions.

Among the few exceptions that applied ES theory to interacting groups were studies done by Littlepage et al. (Littlepage & Mueller, 1997; Littlepage et al., 1995), who examined how perceived characteristics of communication styles could influence both recognition of expertise and influence in decision-making in small, homogeneous culture (American) groups. They developed an extensive list of communication variables by integrating previous studies on related issues, including Bales' (1953) study on the relationship between participation rate and expertise level, and Bottger's (1984) study on the relationship between airtime and expertise judgment. Littlepage et al. found that of these communication variables, four were significantly related to either expertise recognition or influence in decision making, despite their low correlation with communicators' actual expertise. These four

communication style variables were *talkativeness, confidence, dominance, and task-oriented communication* (called use of reason in their paper). They were evaluated using average perceptions by a person's fellow group members. The next section examines the role of cultural assumptions in shaping perceptions of expertise and influence in relation to these four communication variables, with a goal of understanding the combined effects of culture and communication processes on expertise recognition and influence in intercultural groups.

Expertise recognition in intercultural groups

Culture refers to patterns of explicit and implicit behaviors that are shaped by values and traditions, and that are acquired and transmitted by symbols (Kroeber & Kluckhohn, 1952). Because culture is sustained through social interactions, "culture systems may, on the one hand, be considered as products of action, on the other hand, as conditioning elements of future action" (Kroeber & Kluckhohn, 1952, p. 181). Intercultural research has revealed multiple differences in values and social norms between people from different cultural backgrounds, including power distance, uncertainty avoidance, individualism versus collectivism, and femininity versus masculinity (Hofstede, 1983). These culture-level differences exist even in the presence of variations in values and social norms within cultures. For example, research has shown that even though individualism and collectivism coexist in all cultures (Gudykunst et al., 1996), Western cultures are more individualistic and value more independent decision making, while East Asian cultures are more collectivist, value more group harmony and solidarity (Oyserman, Coon, & Kemmelmeier, 2002; Triandis, 2001), and care more about saving face to avoid relationship conflict (Oetzel et al., 2001). In addition to differences in values and norms, cultures can differ in cognitive styles. Research has shown that although thinking-out-loud improved Americans' performance, East Asians performed worse when they were asked to do the same because talking was interruptive to their thinking (H. S. Kim, 2002).

Given the above-mentioned differences in values, social norms, and cognitive styles, it is not surprising that people from different cultures develop different standards about appropriate communication styles (see for a comprehensive review, M.-S. Kim, 1999). Such differences may affect which communication behaviors emerge as status cues that can predict expertise recognition and influence in intercultural collaboration. Specifically, East Asians and Westerners may develop different individual-level ES based on communication styles of talkativeness, dominance, confidence, and task-orientated communication. In Western cultures, talkativeness serves as a status cue of competence (Bottger, 1984; Bottger & Yetton, 1988; Littlepage & Mueller, 1997). East Asians, by contrast, neither value talkativeness as much, nor connect it with competence (H. S. Kim, 2002). As stated in Chinese proverbs, for example, East Asians are likely to believe that "silence is golden" and that "those who talk more err more." Similarly, whereas assertiveness and dominance are used as indicators of competence in Western cultures (Littlepage et al., 1995), East Asians,

by contrast, associate them with aggressiveness and arrogance (Zhang, Butler, & Pryor, 1996). Although confidence is equally valued both in East Asian and Western cultures, people from these cultures may draw on different cues to judge it, with active participation and speech assertiveness as more important markers of confidence for Westerners than East Asians. Finally, differences in cognitive style may affect how East Asians and Westerners exhibit task-oriented communication. For example, research found that Japanese managers were significantly slower in making a decision than American and Canadian managers (Abramson, Keating, & Lane, 1996).

The findings from cross-cultural studies as briefly reviewed above raise challenges in applying ES theory to predict how shared ES will emerge in intercultural group interactions. ES theory stresses the importance of developing "shared" ES in groups (Kalkhoff & Thye, 2006, p. 219). Such shared ES are founded on the assumption that collaborators share "the cultural expectations associated with the characteristics (which) are activated and become the basis of the expectations the members form for their own and each other's performance at the group task" (Berger et al., 1986, p. 11). When members of different cultures infer different meanings from a status cue due to incongruence in values, norms, or cognitive styles, a common basis for shared ES no longer exists in a group. In essence, in order for communication style variables such as talkativeness to affect expertise perceptions in a group over and above actual expertise, group members have to develop convergent expectations that talkativeness is a cue to competence. In mixed-culture Western and Asian groups, that convergence is less likely compared to same-culture Western groups. ES theory does not provide clear propositions about how shared ES can be developed among people who do not share common assumptions about status cues. It is unknown whether the same result might be found for task cues such as communication styles. In the absence of clear propositions from ES theory and research to guide predictions as to whether the same patterns of results found in Littlepage et al.'s studies on culturally homogenous groups also will apply to culturally heterogeneous groups, the following two research questions were raised: First, while research found that (a) talkativeness, (b) confidence, (c) dominance, and (d) task-oriented communication are positively related to expertise recognition in same-culture groups, will the same relationship hold in mixed-culture groups? Second, while research found that (a) talkativeness, (b) confidence, (c) dominance, and (d) task-oriented communication are positively related to influence in decision-making in same-culture groups, will the same relationships hold in mixed-culture groups?

In summary, the research reported here is motivated by twin concerns. On the one hand, accurate expertise recognition has been shown to be critical to groups that have heterogeneous levels and types of expertise. On the other hand, research has shown this type of groups tends to make systematic errors in expertise recognition based on both categorical and communication cues. This research, however, has been conducted in same-culture groups, and ES theory suggests that mixed-culture groups may lack a prerequisite for these types of errors: shared ES.

Methods

Participants

Participants were graduate students from different fields of study at a university in the northeastern United States. Potential participants filled out an initial survey that asked them to report their citizenship and ethnic/cultural backgrounds. American students with Asian backgrounds (Asian Americans) were disqualified from participation. Eligible Chinese participants were citizens of China who had been in the United States less than 5 years. The 5-year stay restriction was modeled after other studies of intercultural communication (e.g., Diamant, Fussell, & Lo, 2009) with the goal of minimizing the effect of the American culture on Chinese people's communication styles. The final sample consisted of 130 graduate students: 67 Americans and 63 Chinese. The age of participants ranged from 20 to 46 ($M = 26.45$, $SD = 4.08$). Participants were compensated $20 each for their participation in the study, and offered a chance to win an additional $30 if their teams ranked in top 5 in performance.

Experimental design and procedure

Because previous research showed a gender effect on expertise recognition and influence (Thomas-Hunt & Phillips, 2004), only all-male ($N = 17$ groups) or all-female ($N = 21$ groups) groups were used in the study. All of the 38 groups were culturally heterogeneous, varying from three members (13 two-Americans and one-Chinese groups; or 9 two-Chinese and one-American groups) to four members (16 two-Americans and two-Chinese-members[1]).

Similar to Littlepage et al. (1995), we used a non-eureka-type intellective decision-making task that has an objective yet difficult-to-verify answer. A pilot study using 15 different participants showed no significant difference in performance on the Moon Survival task between Chinese and American students. Specifically, the task (as used in Bottger & Yetton, 1988; Hirokawa, 1980; Sassenberg, Boos, & Rabung, 2005) presents a scenario of stranded astronauts on the moon. Participants need to first rank individually and then jointly as a group a set of items (e.g., water, star chart, among others) in order of the item's importance for survival. The task has an objective solution, against which individual rank orders were compared to yield a measure of each individual participant's expertise level.

Measurement

To control for the influence of common method effect, the variables used in the analysis were obtained from different sources, including objective performance data (e.g., *actual expertise and expertise recognition*), other team members' evaluations (e.g., *perceived confidence and dominance in communication of a team member*), and behavioral data coded from video recordings (e.g., *talkativeness*).

Control variable

Because the focus of the study is on how communication styles may influence expertise recognition, a group member's *actual expertise* was included as a control

variable. It was determined by comparing each individual participant's ranking of the survival task to the correct rankings (Littlepage & Mueller, 1997). Following the example of Thomas-Hunt and Phillips (2004), only the top 4 and bottom 4 ranks were used because these items represent the most important choices in terms of the survival value. Thus, higher scores represent greater deviation from the correct scores, and, hence, lower level of expertise. Members' *cultural background* was also added as a control variable to examine possible cultural differences in communication styles and in actual expertise on the task.

Independent variables

Talkativeness was measured with behavioral data. First, recorded discussions were transcribed and unitized using Holsti's (1969) definition of an utterance, that is, "a single assertion about some subject" (p. 116). Two coders jointly unitized 18% of the transcripts, with an intercoder unitization agreement of .009 per Guetzkow's (1950) method, in which lower scores indicate better agreement. Upon confirming high intercoder agreement, the remaining unitization task was divided between the two coders. The final results were divided by a constant to make all the variables have comparable variances. Doing so reduces difficulties in achieving model convergence when large differences in variance exist across variables (Kline, 2010).

For communication style, respondents were asked to rate each of their group members on the remaining three communication styles variables that were found to influence expertise recognition and influence in Littepage et al.'s works (Littlepage & Mueller, 1997; Littlepage et al., 1995). The items were adapted from Norton's communication style questionnaire (1978) and Norton and Warnick's (1976) communication assertiveness scale, which measure responses on a 7-point scale with 1 = "Strongly Disagree" and 7 = "Strongly Agree." Because the focus of the study was on whether a person could influence decision-making *across the whole group*, perceptions of a person's communication style were averaged across his/her fellow group members' evaluations. To control for nonindependence of data, group-mean-centered variables were used to estimate scale reliability. Specifically, *confidence in communication* (e.g. confident, tense, etc.) had eight items, with $\alpha = .86$, $M = 5.21$, $SD = .65$; *dominance* (e.g., dominant, aggressive, etc.) had five items, with $\alpha = .88$, $M = 3.83$, $SD = .92$; and *task-oriented communication* (e.g., asked a lot of thought-provoking questions, analytical, etc.) had five items, with $\alpha = .72$, $M = 5.16$, $SD = .60$.

Dependent variables

In Littlepage et al.'s studies (Littlepage & Mueller, 1997; Littlepage et al., 1995), *recognition of expertise* was measured by each member's perception of the other's expertise, with no comparisons between such perceptions and each member's actual expertise. In our study, comparisons were made in two ways, which we believe could better capture the essence of recognition of expertise because perception needs to be evaluated against an objective benchmark to determine its accuracy. The first measure

compared a member's actual expertise ranking in a group with the average expertise rankings s/he received from other members, with positive numbers representing overreporting; negative values, underreporting; and zero, perfectly accurate evaluation. The second measure averaged the absolute value of these difference scores. Because a low difference score represented high accuracy in recognition of expertise, the variable was multiplied by "−1" to facilitate result interpretation. The intraclass correlation coefficients for both measures of expertise recognition were close to zero. Mixed models were run in SPSS nevertheless because scholars recommended conducting multilevel modeling to obtain unbiased estimates of standard errors so long as the data were collected cluster by cluster (Snijders & Bosker, 1999).

Finally, adapted from Thomas-Hunt and Phillips (2004), *perceived influence* was calculated using the mean of two questions asking respondents to rate each member in a group on the extent to which s/he was (a) influential during the discussion and (b) important to the success of the group. A 7-point scale was used, with 1 = "Strongly Disagree" and 7 = "Strongly Agree." These questions correlated significantly at $r = .53$ ($p < .01$),[2] and the average of group members' evaluations was used to represent a group's consensus in evaluating a person's *perceived influence* ($M = 5.55$, $SD = .69$). The intraclass correlation coefficient for influence was .15, which suggested that multilevel models were needed for hypothesis testing (Snijders & Bosker, 1999).

Results

Several considerations informed the statistical analyses. The first was nonindependence of observations coming from members of the same group (Kenny, 1995). To control for this nonindependence, we employed multilevel modeling in the SPSS MIXED procedure that accounts for variability at each level of hierarchically structured data. Also, following Kenny's (2007) recommendation, we ran two social relation models (SRM) to test for a significant partner/ratee effect, which essentially estimates the ratings a given member receives from the other group members, while controlling for the nonindependence in the data. A significant partner effect suggests that a significant proportion of variance in the dependent variable can be attributed to differences in the participants' (i.e., partners/ratees) behaviors, not differences in raters' personal preferences. According to SRM model, finding a significant partner effect is a prerequisite for conducting further hypothesis testing. Using Kenny's recommended procedures, the SPSS SRM analyses showed significant partner/ratee effects for both dependent variables (estimated variance for expertise recognition = .97, $SE = .14$, Wald $Z = 7.06$, $p < .01$; and estimated variance for influence = .65, $SE = .23$, Wald $Z = 2.81$, $p < .01$), suggesting that the observed variances in dependent variables in our study reflected true differences in behaviors across participants.

Because some groups had three members and some had four members, we compared means of all variables included in the study between three-member

versus four-member groups. The second measure of recognition of expertise and the measure of perceived influence showed significant differences across the two types of groups. Among three-member groups, those with a Chinese majority were not different from those with an American majority. Therefore, the analyses reported below were run on the combined dataset of three-member and four-member groups, but with one additional covariate, *group size*, as a control variable.

Recognition of expertise

Following the recommendation by Snijders and Bosker (1999), for the first step a null model was run to partition the variance in the dependent variable, *recognition of expertise*. We started from a random-intercept model, but dropped the random effect because it was not significant. The deviance score of the null model with fixed effect only was 413.59, with an estimated residual of 1.39. Following HLM convention, both of these numbers from the null model were used as a baseline to evaluate improvement in the fit of subsequent models. Model 2 included all the communication variables, along with three control variables (cultural background, group size, and actual expertise). Results showed no significant impact on expertise recognition by talkativeness ($B = -.04$, $SD = .06$, $t = -.56$, $p = .58$), perceived confidence in communication ($B = -.02$, $SD = .19$, $t = -.10$, $p = .92$), nor dominance in communication ($B = .03$, $SD = .11$, $t = .32$, $p = .75$). Also, neither cultural background nor group size predicted expertise recognition. Actual expertise and task-oriented communication were significant, and were retained in Model 3 as described below. The deviance score of Model 2 was 319.83, which represented a significant improvement over the null model, with $\chi^2\ (6) = 413.59 - 319.83 = 93.76$ ($p < .05$). The residual of Model 2 dropped to .85, representing a reduction of 39% of unexplained variance in recognition of expertise. The results of Model 2 show that only one of the communication style variables, task-oriented communication, was related to expertise recognition.

In Model 3, only significant predictors from Model 2—actual expertise and task-oriented communication—were included to create a more parsimonious model. The residual of Model 3 was .85, which although not improved over Model 2, still represented a significant drop from Model 1. The results showed that expertise recognition was significantly influenced by actual expertise ($B = .09$, $SD = .01$, $t = 8.72$, $p < .01$) and task-oriented communication ($B = .44$, $SD = .14$, $t = 3.26$, $p < .01$).

Identical models were run in Model 4 to Model 6, with the second measure of *recognition of expertise* as the dependent variable. The models revealed identical patterns of results with the earlier models, that is, actual expertise ($B = .02$, $SD = .01$, $t = 2.39$, $p < .05$) and task-oriented communication ($B = .25$, $SD = .10$, $t = 2.49$, $p < .01$) were the only two variables that significantly impacted recognition of expertise.

Table 1 HLM Results for Recognition of Expertise

	Recognition of Expertise: Measure 1			Recognition of Expertise: Measure 2		
	Model 1: Null	Model 2	Model 3	Model 4: Null	Model 5	Model 6
Cultural background		.24 (.21)			−.07 (.15)	
Group size		−.08 (.18)			.22 (.13)	
Individual actual expertise		.10** (.01)	.09** (.01)		.03* (.01)	.02* (.01)
Talkativeness		−.04 (.06)			−.03 (.05)	
Confidence in communication		−.02 (.19)			−.01 (.14)	
Dominance in communication		.03 (.11)			.14 (.08)	
Task-oriented communication		.54** (.18)	.44** (.14)		.28* (.13)	.25** (.10)
Deviance	413.59	319.83	358.19	281.49	250.82	281.43
Residual variance	1.39	.85	.85	.50	.44	.47

**$p < .01$ (one-tailed). *$p < .05$ (one-tailed). ^$p < .05$ (two-tailed).

Taken together, models for RQ1 showed that beyond a person's actual expertise, only task-focused communication was a significant predictor of whether his/her expertise could be accurately recognized, and thus was the only communication style variable that potentially influenced expertise perceptions. The results are summarized in Table 1.

Perceived influence

Following the same analysis procedure as above, a null random-intercept model (Model 7) was run first. The deviance score of the null model was 272.79, and the estimated residual for this model was .41. In Model 8, all the independent variables used in Model 2, along with recognition of expertise, were included in the model. Results showed no significant impact on perceived influence by recognition of expertise using either Measure 1 ($B = -.02$ $SD = .05$, $t = -.39$, $p = .70$) in Model 8 or Measure 2 ($B = -.12$, $SD = .07$, $t = -1.80$, $p = .08$) in Model 9. Neither talkativeness ($B = -.02$, $SD = .04$, $t = -.42$, $p = .67$ in Model 8; and $B = -.02$, $SD = .04$, $t = -.42$, $p = .67$ in Model 9), nor dominance in communication ($B = .01$, $SD = .06$, $t = .09$, $p = .93$ in Model 8; and $B = .02$, $SD = .06$, $t = .30$ $p = .77$ in Model 9) had any impact either. In comparison to the null model, the deviance score of this model dropped from 272.79 to 185.81 in Model 8, and to 182.16 in Model 9; and the residual also dropped from .41 to .18 in Model 8 and .18 in Model 9, all of which indicated considerable reduction in the unexplained variance in influence in decision-making. In Model 10, only significant predictors from Model 8 and 9 were included to create

Table 2 HLM Results for Influence in Decision Making

	Model 7: Null	Model 8	Model 9	Model 10	Model 11
Cultural background		.21ˆ (.11)	.20ˆ (.11)		
Group size		.04 (.13)	.07 (.13)		
Individual actual expertise		.02* (.01)	.02** (.01)		
Talkativeness		−.02 (.04)	−.02 (.04)		
Confidence in communication		.32* (.11)	.31* (.11)	.41** (.08)	
Dominance in communication		.01 (.06)	.02 (.06)		
Task-oriented communication		.50** (.10)	.53** (.10)	.49** (.09)	.68** (.08)
Recognition of expertise: Measure 1		−.02 (.05)			.08* (.04)
Recognition of expertise: Measure 2			−.11 (.07)		
Deviance	272.79	185.81	182.16	191.89	216.00
Residual variance	.41	.18	.18	.19	.24

**$p < .01$ (one-tailed). *$p < .05$ (one-tailed). ˆ$p < .05$ (two-tailed).

a more parsimonious model, with the exception of actual expertise because it turned nonsignificant.[3] The deviance score of Model 10 was 191.89, and, although it was higher than in Models 8 and 9, the differences were not statistically significant ($df = 7$, $p > .05$), indicating that Model 10 was a more parsimonious model that also fit the data equally well.

Taken together, the results for RQ2 showed that perceived influence was significantly influenced by two factors only: task-oriented communication ($B = .49$, $SD = .09$, $t = 5.82$, $p < .01$) and confidence in communication ($B = .41$, $SD = .07$, $t = 5.48$, $p < .01$). The full results are summarized in Table 2.

Discussion

The main goal of this research was to fill the void in existing TM and ES research by examining the combined effects of culture and communication processes on expertise recognition and influence in intercultural groups. The integration of these two theoretical approaches provides a deeper understanding of how differences in cultural backgrounds might affect assessments of cues used as expertise proxies in intercultural collaboration. Our findings depart from previous research findings based on studies of same-culture, American-member groups, and suggest that expertise recognition and influence judgments were primarily driven by evaluations of factors valued by members of both cultures. The next section discusses in more detail the results comparison of this study with previous research on same-culture groups, as well as conceptual contributions and future research directions suggested by our findings.

Result comparisons

Although the focus of our study was expertise recognition and influence in intercultural groups, the comparison of our findings with similar research on same-culture groups can improve conceptual understanding of processes through which groups come to develop expertise perceptions. Our results were similar to Littlepage et al.'s results in one significant way: Task-oriented communication predicted both expertise recognition and perceived influence. Some results were partially consistent with the prior research in that confidence predicted perceived influence; however, by contrast, confidence did not predict expertise recognition. Finally, some results differed from the prior research significantly: First, neither talkativeness nor dominance predicted either expertise recognition or perceived influence, as had been found in the prior studies; second, whereas Littlepage et al.'s research found no significant connection between actual expertise and recognition of expertise, our study showed a significant relationship between them. In combination, these results suggest that (1) actual expertise may be more accurately perceived in mixed-culture groups, (2) communication styles that are equally valued across cultures may be a basis for the formation of shared ES that can influence perceptions of expertise and influence, and (3) communication styles that are valued differently across cultures may have no influence on expertise recognition and influence.

Research on information processing and source credibility provides useful insights on how to make sense of these different results across studies. The dual information processing model (Chaiken & Maheswaran, 1994) suggests that people process information either systematically by focusing on the content of the argument per se, or heuristically by focusing on the peripheral aspect of a message in spite of the actual quality of the argument. Among the four variables studied in this research, task-oriented communication is essential for triggering systematic information processing, while confidence, dominance, and talkativeness are typical peripheral cues that trigger heuristic information process. Results from Littlepage et al.'s studies (Littlepage & Mueller, 1997; Littlepage et al., 1995) seem to suggest when people share common cultural backgrounds and hence common understanding of what status cues are indicative of competence, heuristic information processing may be involved in how those factors influence perceptions. Of course, there may be other culture-related cues that are implicated in heuristic processing, such as accent and usage of grammar, that would influence expertise judgment. However, because people in mixed-culture groups do not typically have common understanding of whether accent implies expertise (e.g., a person who speaks with an accent him/herself will be less likely to use accent as a status cue to judge the other's expertise), these cues are less likely to be used across the group for heuristic judgment of expertise. Future research should be directed to uncovering the cues that might lead to systematic versus heuristic processing, as well as possible intervention strategies that can increase the likelihood of systematic information processing in group processes. For example, Henry (1995) found that a reminder to focus on tasks per se could increase systematic information processing in homogeneous cultural groups.

Taken together, the results seem to show that when one of the cultures does not value certain characteristics of communication styles as valid status cues, their influence on group decision-making is more likely to be compromised.[4] As reviewed earlier, people from East Asian cultures see a weaker connection between talkativeness and competence than their Western counterparts and may even see talkativeness as inversely related to competence. However, both East Asians and Westerners value confidence in communication: Confirmed in our pre-experiment interviews, confidence, along with task-oriented communication, was one of the few common characteristics identified by both Chinese and American interviewees as an important indicator of competence. Taken together, the results suggest that a person might not be able to influence decision-making unless s/he communicates in a style accepted by all parties as a cue to status and expertise.

The comparison of the results from our study and similar research on same-culture groups also raises questions about the relationship between recognition of expertise and influence. Whereas Littlepage et al. (1995) provided a clear test of this relationship using structural equation modeling and the result was significant (p. 882), this relationship was explored using correlational analysis ($r\ (30) = .42$, $p < .05$) in their later study (Littlepage & Mueller, 1997, as reported on p. 327). Given the questionable value of using zero-order correlations for hypothesis testing, the relationship between the two constructs was unclear from their second study. In our study, the relationship between recognition of expertise and influence was not significant in HLM modeling, despite significant zero-order correlation. In a post hoc exploratory analysis (Model 11), we found evidence of possible mediation effect of confidence on the relationship between expertise recognition and influence: When confidence was removed from the model, the relationship between expertise recognition and influence became marginally significant ($B = .08$, $SD = .04$, $t = 1.96$, $p = .05$). Taken together, the results seem to suggest that an expert, even when his/her expertise is adequately recognized, still needs to communicate confidently to influence decision-making in group collaboration. This is intriguing because TM theory assumes that if expertise is properly recognized, it will become part of the communication system in the group. Our findings hint at the possibility that even when groups recognize a person's expertise, that does not guarantee his/her influence in the group.

Conceptual contributions

Our study contributes to research on both group dynamics and intercultural collaboration. As discussed earlier, failure in expertise recognition has been identified as one of the major factors that prevent a group from achieving its full potential (Littlepage & Mueller, 1997). In recent years, the rise of TM theory calls for further studies to better understand the role that accuracy in expertise recognition plays in group collaboration because of its crucial importance for high collective productivity, especially in cross-functional groups. Understudied in TM research across all types of groups (i.e., culturally homogeneous and heterogeneous), however, are

the antecedent factors that influence the development of such accurate knowledge of expertise, with the exception of studies on the impact of gender and cultural stereotypes (Hollingshead & Fraidin, 2003; Yoon & Hollingshead, 2010), group versus individual training (Moreland & Myaskovsky, 2000), and social capital (Yuan, 2009; Yuan, Fulk, et al., 2010). By drawing on ES theory about communication styles as potential predictors of expertise, we believe that our research has made a useful contribution to this area of TM research by identifying the initial set of communication cues that matter for expertise recognition and influence in intercultural collaboration.

This study also contributes to research on ES theory in several ways. First, this study has extended the ES application from culturally homogeneous to culturally heterogeneous groups, and by doing so raised interesting questions about some basic assumptions of ES theory. ES theory specifies that interaction behaviors serve as sources of ES only in the absence of salient social differentiation with regard to status, as in Littlepage et al.'s (1995, 1997) studies. However, as argued by Bonito (2001, 2003a, 2003b), interaction behaviors, especially substantive comments, can influence expertise judgments in socially heterogeneous groups too; and, thus, it is important to do an "in-process" analysis of interaction (Bonito, 2003a) along with the analysis of a group's status order based on pre-existing social categories. An intercultural setting as studied in this research allows the examination of expertise perceptions based on both communication behaviors and social categories, and consistent with Bonito's arguments our study supports the role of task-oriented communication in culturally heterogeneous groups.

Second, intercultural groups pose a challenge to one of the main assumptions of ES theory, mainly, that people share similar interpretations of status cues (Berger et al., 1986; Wagner & Berger, 2002). Although extensive studies have been conducted to test the theory, all assume that partners have shared understanding of which social cues indicate status. Such shared understanding, however, may not always pre-exist among group members, as, for instance, in the mixed-culture groups studied in this research. As we argue above, American and Chinese group members are likely to make different inferences about expertise and competence from the same communication behaviors (e.g., dominance and talkativeness) due to differences in cultural assumptions and values. Future ES research should pay more attention to when and how shared understandings of status cues evolve and develop in interacting groups.

Our research also contributes to intercultural research by providing an explicit examination of factors that may influence the success of such collaboration. The fast growth in the globalizing economy suggests a need for more research on the impact of culture on group collaboration (Earley & Gibson, 2002). Our research has answered Levine et al.'s (2007) call for more research that directly examines how people from different cultural backgrounds collaborate with each other. The results demonstrate the importance of at least some communication styles in influencing the success of intercultural collaboration. They complement findings from previous

research on intercultural differences. For instance, Kirchmeyer (1993) found Asian students spoke less in group discussion. Because Asian students were in a minority in numbers in her study, it is less clear whether their cultural background or their minority status caused the observed low participation of Asian students. As a similar pattern emerged in groups in our research in which Asian members were not a minority, our findings point to the role of culture in influencing Asian members' lower levels of participation.

Limitations and directions for future research

The current research has a few limitations that point to areas of future research. First, participation in our study was voluntary as is consistent with human subjects protection, and self-selection bias may have influenced the results in unknown ways. To increase generalizability of these findings, future research should replicate this study in a different setting and with different participants. Second, in this study, we tested intercultural collaboration in groups that had three to four members. Although groups can have different sizes, and using three- and four-member groups are common in small group research, future research should replicate these findings with larger groups. Third, the participants in our study were American and Chinese. Future research should explore whether the same dynamics hold for other combinations of cultures (e.g., French versus Korean). Fourth, when studying other cultures that are not as typical examples of individualistic and collectivistic cultures as the American and Chinese cultures as used in this study, cultural values need to be measured explicitly at the individual level. Fifth, the Chinese participants were limited to those who have been in the United States for less than 5 years. Future research should also explore whether the same finding still holds for people with various lengths of exposure to the other parties' culture. Sixth, this study used same-gender groups. Future research should also explore whether the same pattern of results will hold in mixed-gender groups. Seventh, because the current research aimed to extend findings from Littlepage et al.'s research, we used a survival task that was comparable to their studies. Future research should try replicating these findings with other types of tasks that would allow tapping more deeply into each participant's expertise background than the survival task. Finally, in this study we used a two-item network measure to evaluate influence in decision-making. Although the patterns of results were identical when the two items were used either separately or jointly as a scale, future research should try to increase the number of items for this measurement to boost scale reliability.

Conclusion

Effective expertise recognition is critical to successful group performance, and yet groups often fail in this endeavor. Our study has extended research on the role of communication styles in expertise recognition and influence from culturally homogeneous to culturally heterogeneous groups. The results show both similarities

and differences from earlier works, which attest to the importance of members' shared expectations states about status cues on expertise recognition and influence in collaboration. These findings suggest some new directions for intercultural group research, as well as for conceptual development of TM and ES theories.

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Notes

1 Only four-person groups were created for the study, but a few participants who agreed to participate did not show up for the experiment at the appointed time. We decided to keep these groups in the analysis but to use group size as a control variable to examine whether there was a difference in results for three-versus four-person groups. The results showed that the impact of group size was not significant.
2 We also split the two-item scale, and tested our models using each individual item separately. As the patterns of results were identical across all models that used either individual or combined items, we reported results from the model that used combined measures only.
3 Although actual expertise was significant in both models, it was dropped in the final model because during stepwise trimmings of the model, it turned insignificant. This finding is consistent with the result from correlational analysis: Actual expertise correlated with influence at only .08 ($p > .05$).
4 Although we did not have homogenous-culture groups in our study as a control group to make direct comparisons between homogeneous and heterogenous-culture groups, results comparison between the two studies about the impact of culture on group dynamics is still valid because in our study we followed very closely every step described in Littlepage et al.'s studies, starting from research design to the final execution of the study.

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