Where Did We Turn Wrong? Unpacking the Effects of Culture and Technology on Attributions of Team Performance

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ABSTRACT

Computer-mediated collaboration is becoming an increasingly prevalent form of work ([22]). At the same time, organizations are relying more and more on culturally diverse teams to staff knowledge-intensive projects (e.g., software development, customer service, corporate training,). We conducted a laboratory study examining the role of collaborative technologies and culture on 2-person team members' attributions of causes for their collaborative performance. Pairs of American, Chinese, and intercultural American-Chinese students collaborated on two map navigation tasks using one of three technologies: video, audio, or IM. As predicted, culture and technology interacted to affect the extent to which members attributed performance to dispositional factors (e.g., personality or mood) vs. situational factors (e.g., the technology or task difficulty). We discuss the implications of our results for cross-cultural collaborative work.

Author Keywords

CSCW, distributed work, empirical studies, coordination mechanisms, intellectual teamwork, cross-cultural communication, attribution processes

ACM Classification Keywords

J.4. Social and behavioral sciences: Psychology. K.4.3 Computers and Society: Organizational Impacts: Computer-supported collaborative work.

INTRODUCTION

Individuals in computer-mediated collaborations face numerous challenges in comparison to their face-to-face peers, including different communication styles, difficulty establishing common ground, and differing interpretations of the task and of their partner's actions ([5], [16], [27]).

Figure 1. **Attributions in teamwork. When faced with a partner's inaction, people reason about the causes for this inaction. Here, a worker who hasn't received a report considers a dispositional explanation (the partner is lazy, hanging out on the beach rather than working) vs. a situational explanation (the partner's computer has a virus).**

Besides affecting task outcomes, those challenges often have second-order effects on the nature of the interaction among collaborators ([34], [15], [35] [19]). Those collaboration challenges stem largely from the reduced social and contextual cues that can be communicated with different technologies ([35], [19]), the distributed nature of the task [5], and the cognitive demands that the technology places on the ability of users to attend to both task-related and social information while working with a partner [15].

However, prior studies have compared some form of virtual teamwork against face-to-face collaboration (with a few exceptions, e.g., [39], [15]). To examine the role of virtual

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collaboration in a systematic manner, we need to look inside the various ways in which team is 'virtual', and identify effects of different virtual conditions by comparing them against each other rather than just against face-to-face conditions. In this study, we differentiate between teams collaborating via three technologies (video, audio, instant messaging [IM]). Also, we assess culture as both an individual difference and as a team (dyad) characteristic to distinguish its effects at both levels of analysis.

We focus on participants' attributions of performance because that is an intermediary mechanism through which cultural differences and the virtual nature of the collaborative task have been separately found to affect performance ([1],[5], [7]). We integrated those approaches to present a more detailed picture of the role of culture and technology across different configurations of teamwork.

We conducted a laboratory study in which 95 dyads of participants performed two collaborative map navigation tasks in one of three media (audio conferencing, video conferencing, IM). Dyads were constructed to form three cultural composition conditions (homogenous-American, homogenous-Chinese, American-Chinese). After each task, participants indicated the extent to which they believed their performance was attributable to the collaboration itself, to their own or their partners' moods or personalities (dispositional attributions), or to the technology or task difficulty (situational dispositions). As we will show, culture and technology had an interactive effect on members' attributions of performance. The effect of technology, however, was not in the same direction for the two cultures: the greater visibility of one's partner in video-conferencing increased the dispositional bias of American participants but did not affect Chinese participants' situational bias. The lack of visibility in audio and IM reversed the Chinese participants' situational bias but did not affect Americans' dispositional bias. In the following sections, we present a brief literature review of related studies, our hypotheses, the research design, our results and discussion, and conclude with a discussion of the implications of our results for cross-cultural collaborative work.

BACKGROUND

Attribution theory states that people make different decisions about the causes of events, such as their team's performance on a task, if they have different kinds of cues about their partners (e.g., different visibility of their partner's actions during the task [5]). Poor performance, for example, might be attributed to a partner's personality or lack of interest (dispositional attributions) or to technical problems and to task difficulty (situational attributions). Previous research suggests that members of distributed teams tend to attribute performance to dispositional factors such as their partners' effort, without considering situational factors, such as technical constraints and information transmission delays ([5], [12], [36]). This is significant because the kind of attributions people make affect not only their work outcomes but also their perceptions of their partners [44], how much effort they expend on the task, and their motivation to learn from their performance [9].

Research in cultural psychology, on the other hand, indicates that members of collectivistic cultures, such as China or Japan, are more likely to make situational attributions, whereas members of individualistic cultures, such as that of the U.S., are more likely to make dispositional attributions [11]. Furthermore, these cultural differences in attributional styles may be influenced by the richness of the communication technology. Below we discuss those two research streams in greater detail.

Effect of Technology on Attributions

Previous studies have examined how the technology used to perform a collaborative task influences the attributions people make about their partners and about their team's performance (e.g., [19], [35], [12], [36], [15]). Different technologies (e.g., audio-conferencing, video-conferencing, or text communication) have different capacities to convey cues about one's partners. Those cues can be information about the partner's personality and mood as well as about their physical work context (e.g., the materials partners might have available during the task). As cues about the work context of one's partners are reduced, attributions tend to become more dispositional.

More specifically, research in computer-mediated communication has looked at how different technologies influence the way individuals perceive their collaboration partners (e.g., [19], [35], [12], [36], [15]). Hancock et al. [12], for example, found that people's impressions of their partner's personality were more intense and less detailed in CMC than face to face. Similarly, Storck and Sproull [35] found that participants' impressions of each other were less favorable in video-mediated vs. face-to-face collaboration, although there were no objective differences in task performance.

One proposed explanation for the effects of technology on attributions is that collaboration technologies reduce contextual cues in comparison to face-to-face interaction (cf. [19]), some more so than others. When cues about a partner's actions and activities during the task are available, people often attribute behavior to situational factors. For example, in face-to-face settings, it is easy to see when a piece of equipment is broken and to justify a teammate's tardiness by way of a situational attribution. When less contextual information is available (e.g., when one cannot observe whether a partner is experiencing a technical problem), people tend to make dispositional attributions. The precise ways in which a technology influences attribution depends on its affordances [2]. For example, video conferencing systems can provide views of facial expressions (e.g., [8]) and/or work areas (e.g., [20]) that may be helpful for understanding the causes of the partner's behavior. At the same time, people tend to be unaware of

the biases induced by collaboration technologies. For example, studies of space mission engineering teams found that people made numerous misattributions of others' situational constraints even though they were all using the same technology to collaborate [23].

An important distinction with regard to contextual cues is what kinds of cues are visible in video-mediated collaboration: in some studies it is only participants' faces (head views) that are visible, while in others the physical work context is also visible ([7],[5], [15]). This difference is important because making the physical work environment visually available should lead to more situational attributions. Head views, on the other hand, increase the partner's visibility but not the visibility of that person's work environment. In the current study, we wanted to examine whether partner visibility per se (head views) would influence attributions in the absence of cues about the work environment. We used a video system in which participants could see only their partner's faces in order to hold the amount of contextual (workspace) information constant across media conditions. This approach allows us to disentangle media effects from of the effects of the different kinds of information that can be transmitted through a single technology.

Under conditions of high visibility, that is, when partners can see each other during the task, we would expect their attributions to be more influenced by cues about their partner's behavior, attitude, personality and mood. When a partner is made more visible during task performance (e.g., via video), that partner is also more cognitively accessible. This implies that attributions in the high-visibility condition will tend to be more dispositional; their content is more likely to be about the partner's personality and characteristics than about the technology or other aspects of the context of the task. In low-visibility conditions, such as text-based IM, one's partner is not as cognitively accessible, cues about the context such as the technology and task characteristics can be as accessible as cues about the partner's behavior and personality. Based on that reasoning, we expect attributions to be more dispositional when individuals are collaborating in a higher-visibility condition versus when they are in a lesser visibility condition.

H1: Participants will make more dispositional attributions in technologies that increase the visibility of their partner. Attributions will be more dispositional in Video, than in Audio, than in IM.

Culture Effects on Attributions

A person's cultural background affects the way he or she perceives others (e.g., [1], [30]). Members of individualistic cultures, such as that of the United States, value personal initiative and independence, and tend to attribute performance to internal dispositional factors (e.g., members' personality and intelligence). In contrast, collectivistic cultures, such as that of China, value group solidarity and tend to rely on situational information (e.g., nonverbal behavior, relationship between participants) when solving a problem. They also tend to look for external, non-human causes for their behavior ([11]) and to attribute performance to situational factors (e.g., the technology).

H2a: Chinese participants will make more situational attributions than American participants.

H2b: American participants will make more dispositional attributions than Chinese participants.

Cultural differences also affect the attribution process through the common identity (or lack thereof) between the individual making the attributions and his/her partner. More often than not, attributions are made not by individuals thinking in isolation but in the context of a group or the partner with whom they collaborated. Inferences about their group's behavior might be influenced not only by one's own cultural biases but also by their partner's identity or the extent to which the person making the attributions shares the same or different cultural assumptions with their partner. Social identity research has shown that individuals' inferences about the causes of group behavior are influenced by the identity and background of their collaborating partners. More specifically, individuals tend to perceive similar others in a more favorable light than they do those who do not share their culture ([37],[6]). More specifically, the tendency of members of a particular group to favor those sharing their cultural membership is commonly referred to as ethnocentricism ([28],[14]). Ethnocentric attributions involve explaining outcomes such as group performance by referring to dispositional factors when one works with a culturally similar partner. When working with a culturally dissimilar partner, attributions tend to become situational ([28], [37]). We anticipated that:

H3a: American participants working with a culturally similar partner will make more dispositional attributions than American participants working with a culturally dissimilar partner.

H3b: Chinese participants working with a culturally similar partner will make more situational attributions than Chinese participants working with a culturally dissimilar partner.

Interactive Effect of Technology and Culture

Research on culture and computer-mediated communication has observed different media uses across cultures both in field studies and laboratory experiments ([31],[24], [18]. The observed cultural differences were in terms of satisfaction with the team ([24], [6]), and decision making ([38]). To date, no studies that we know of have examined how culture and media interact to shape attributional processes. We would expect that the visibility of one's partners will increase the salience of that partner. The individualist predisposition to make dispositional attributions will thus be amplified when a partner is made more visible without at the same time making other aspects of the task context salient. That is, we expect that

technologies that increase the partner's visibility will amplify the individualist tendency and will mitigate the collectivist tendency on attributions.

H4a: Americans will make more dispositional attributions in Video, than in Audio, than in IM.

H4b: Chinese participants will make more situational attributions in IM, than in Audio, than in Video.

METHOD

Overview

The effects of culture and technology on attributions, performance were examined in an experiment in which dyads performed two map navigation tasks using one of three technologies: video conferencing, audio conferencing, or IM. Each of these technologies provides different kinds of cues that can be used in forming perceptions about a partner. One third of the pairs was comprised of two U.S. citizens, one third was comprised of two citizens of the People's Republic of China or Taiwan, and one third was comprised of one American and one Chinese member. After completing each map, pairs completed a post-task survey in which they rated task effort and possible causes of their collaborative performance. At the end of the experiment, participants completed a final survey in which they provided demographic information, completed a personality inventory, rated the technology they used to communicate, and rated their partners on several dimensions. Objective performance was calculated by assessing deviations between the instruction-giver's route and the route drawn by the instruction-follower.

Participants

Participants consisted of 190 students at a U.S. academic institution (92 American; 90 Chinese born and raised in the PRC and 8 in Taiwan). The Chinese participants were all fluent in English but had been in the U.S. to study for less than 5 years*. That minimized the likelihood that their attribution-related predispositions would be substantially affected by the individualist US environment. Chinese participants were recruited from a US university and had been living less than 5 years in the US. The university uses an intensive screening process to ensure English competency before enrollment. Any differences in English competency are randomly spread through the data because we assigned participants to conditions randomly. Participants were assigned either to a partner of the same cultural background or to a partner of the other cultural background, creating three cultural groups: American-American (AA), Chinese-Chinese (CC), and American-Chinese (AC). Pairs were then randomly assigned to one of the three technology conditions (Audio, Video, IM).

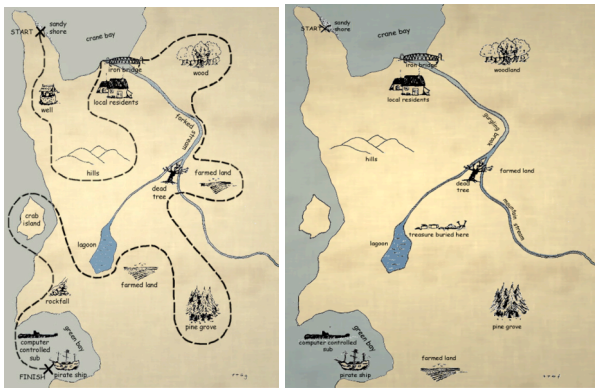

Figure 1. A pair of maps used in the study. The map on the left is for the instruction-giver and indicates the route to be traced. The map on the right is for the instruction-follower and does not indicate the route.

Materials

Participants completed two tasks, each of which involved the instruction-giver describing a route on a map to the instruction-follower. Each map has two versions, one for the instruction-giver that included the route to be traced, and one for the instruction-follower that did not include the route (Figure 1). The landmarks on the two maps are not identical, adding challenge to the task. These maps, which were obtained from the HCRC project (www.hcrc.ed.ac.uk) have been used in previous CMC studies (e.g., [8] [41]).Additional materials included post-task and post-experimental surveys containing the questions described below under Measures. These were distributed online.

Equipment

In the video condition, web cameras located above each participant's monitor sent a head and shoulders view of that participant to his/her partner. Video was displayed full-screen on a color 13-inch monitor located directly in front of each participant (see Figure 2). Sony wireless microphones were used to record audio in both conditions. In the IM condition participants used a standard text-based system that did not include photos or any other personal information.

Figure 2. Arrangement of equipment in the video condition.

Procedure

Participants filled out consent forms and then were seated at computers separated by a large barrier that prevented them from seeing one another. Participants were given their first

map and assigned randomly to be either the instruction-giver or the instruction-follower for that (first) task. They were then given instructions about navigating the map, which explicitly stated the goal of the navigation (reach the destination, pass through all the landmarks, complete the task as fast as possible). They then started working on the first map. After finishing the first map they completed a post-task questionnaire to assess their views of how well they coordinated the navigation with their partner, their understanding of the task and the attributions they made about their performance on the task. They then switched roles between Instruction-giver and Instruction-follower and worked on the second map. At the end of the experiment, they completed another questionnaire assessing their ratings of the technology, ease of communication, and perceptions of their partners. Then they were provided with further information about the purpose of the study, paid a small fee for their time and dismissed. The materials and conversation were all conducted in English, even for the Chinese/Chinese pairs. This was done to ensure the comparability of data between Chinese in CC and AC dyads.

MEASURES

Three sets of dependent measures were collected: post-task survey responses, completed after each of the two map tasks, post-experimental survey responses, collected at the completion of both map tasks, and performance data, extracted from the instruction-followers' maps.

Post-Task Measures

After each of the two tasks, participants rated the effort of the task and assigned credit for the group's performance:

Task effort. Participants rated the physical, temporal and mental demands of the task using the NASA TLX [13]. Ratings to the three questions were averaged (α= .77).

Attributions. After each navigation task, participants rated 14 possible causes for their task performance on a scale of 1 (not at all important) to 7 (extremely important). The attribution scale was adapted from Cramton et al ([7], [5]). Factor analysis indicated the presence of three attributions factors (Table 1). Factor I pertained to one's own and one's partner's communication, collaboration and effort; items were averaged to create a general collaboration scale (α= .85). Factor II reflected dispositional attributions, including one's own mood and personality as well as that of one's partner (α= .86). Factor III was comprised of predominantly situational factors, including the technology and map difficulty, although it also included map-specific navigational skills (α= .65).

Post-Experimental Measures

After completing both tasks, participants completed a post-experimental survey in which they answered questions about the technology, themselves, and their partner.

Table 1. Attributions of performance with factor loadings.

	I	II	III
Partner's collaboration skills	.81		
Partner's communication ability	.81		
Own collaboration skills	.74		
Own communication ability	.69		
Partner effort	.63		
Own effort	.59		
Own personality		.86	
Partner's personality		.83	
Partner's mood		.72	
Own mood		.72	
Partner's navigation skills			.73
Own navigation skills			.71
The technology			.67
Map difficulty			.51

Partner characteristics. Participants responded to seven questions about their partners on a scale of 1 (strongly disagree) to 7 (strongly agree). Factor analysis indicated the presence of two factors, one reflecting the helpfulness of the partner (e.g., my partner is helpful, my partner performed his/her part of the task well), and the other the similarity between self and partner (e.g., my partner thinks like me). Scores were averaged to create one "partner as collaborator" score (α= .91) and one partner similarity score (α= .82).

Technology Support for Collaboration. Participants rated how well the technology supported communication, collaborative navigation, establishing common ground, feedback, and error correction on a scale of 1 (very weak support) to 5 (very strong support). All scales loaded on a single factor; scores were averaged to create a technology support score (α= .90).

Individualism and collectivism. Participants completed Triandis' individualism/collectivism scale [40]. A composite score was created by averaging the 6 collectivism items (α= .52) with the inverse of the 7 individualism items (α= .67).

Performance Measure

Route accuracy. We scored each of the individual segments of the route, that is, the paths to and around a series of landmarks. Each map was decomposed into 15 segments and each segment was scored as correct (1) or incorrect (0). Final route scores were created by averaging across all the subroutes, and ranged from 0 to 1. For the final analysis, we averaged route scores across the dyad's two map tasks.

RESULTS

We tested our hypotheses by analyzing the effects of culture, technology, and their interaction on attributions, effort, partner perceptions, perceived support of the technology, and dyad performance. We used a mixed

within/between subjects design. Dyad culture (AA, AC, CC) and medium (Video, Audio, IM) were between-subjects factors. Map trial was a within-subjects factor. In the following analyses, attributions are analyzed at the individual level because they reflect what *each member* thinks about his/her dyad's performance. A preliminary analysis showed that dyad members were no more likely to agree on these attributions than any two randomly selected participants. In contrast, performance and communication measures are analyzed at the dyad level, because they reflect the joint contribution of both members of the dyad. Preliminary analyses also showed that there was no effect of which of the two maps a pair was working on ($F < 1$, *ns)*. In the following analyses, we averaged across the pairs' two map tasks.

Attributions for Performance

We examined attributions to properties of the collaboration itself, to dispositional factors, and to situational factors as a function of culture and technology using a 2 (participant culture) by 2 (partner culture) by 3 (technology) by 3 (attribution category) ANOVA. The attribution questions factored similarly for Americans and Chinese participants. Consistent with Hypothesis 1, dispositional attributions increased in the video condition (F [4, 178] = 4.54, $p < .001$), whereas situational attributions were equivalent across all technologies (Figure 3).

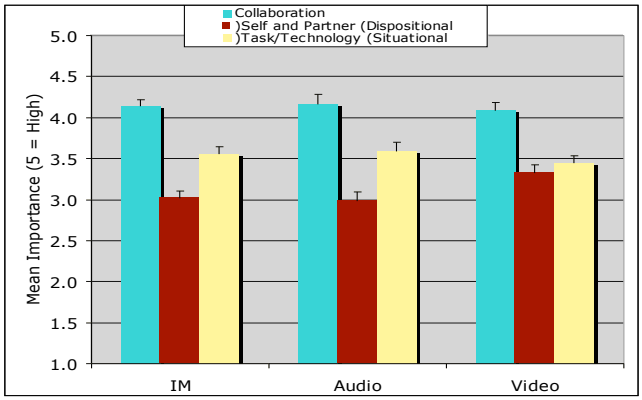

Figure 3. Attributions by technology

Consistent with Hypothesis 2, Americans made more dispositional attributions than did Chinese participants, whereas the opposite was true for situational attributions (F [2, 178] = 7.76, $p < .001$). Consistent with Hypothesis 4, culture and technology interacted in affecting the kinds of attributions participants made (F [2, 178] = 4.25, $p < .002$). As shown in Figure 4, this interaction is most pronounced for dispositional attributions (moods, personality). Contrary to Hypothesis 3, there was no effect on attributions of whether a dyad was culturally diverse or homogeneous, nor did the dyad's cultural composition interact with medium.

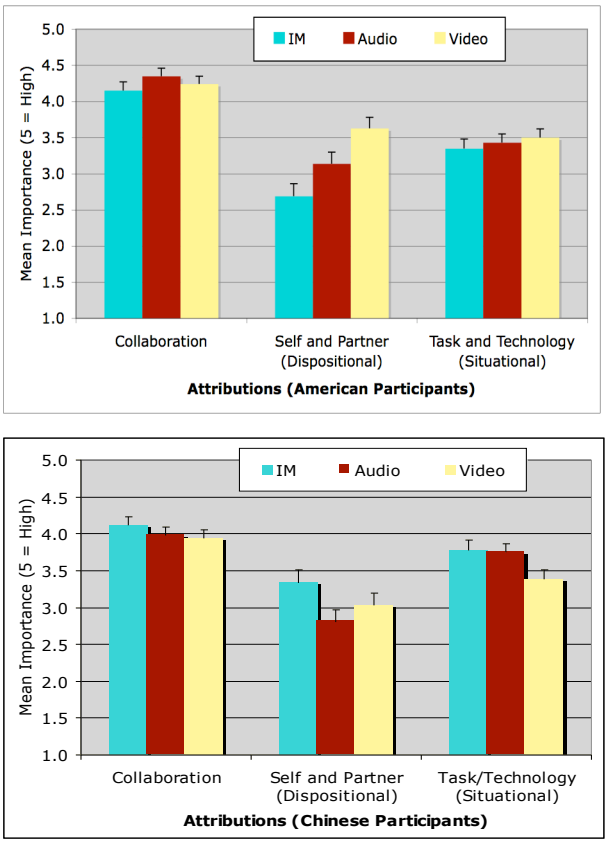

Figure 4. Attributions as a function of technology, for American (top) and Chinese (bottom) participants.

Task Effort

Participants' TLX scores were averaged across the two maps and then analyzed in a 2 (participant culture) by 2 (partner culture) by 3 (technology) ANOVA. There were no main effects or interactions, suggesting that the effects of culture and technology on attributions did not result from a confounding factor such as greater task difficulty in some media or for one of the cultures.

Perceptions of Partners

Participants' ratings of the helpfulness and similarity of their partners were analyzed in a 2 (participant culture) by 2 (partner culture) by 3 (technology) MANOVA. There was an overall significant effect of participant culture (MANOVA F [2, 177] = 4.93, $p < .01$). Univariate tests showed that Chinese participants rated their partners as more similar to themselves (F [1, 77] = 13.93, $p < .005$) and tended to rate their partner as more helpful than did American participants (F [1, 177] = 3.24, $p = .07$). There were no main effects or interactions with partner's culture or technology.

Technology Support for Collaboration

Participants' ratings of the degree of support the technology provided for task communication and performance were analyzed in a 2 (participant culture) by 2 (partner culture) by

3 (communication medium) ANOVA. There was a trend for Chinese participants to rate all media higher than American participants (F [1, 178] = 2.90, p = .07) but no other main effects or interactions.

Performance

Performance was measured by the accuracy of the follower's route from start to finish. Since performance is a dyad level variable, we analyzed pair's scores in a 2 (dyad cultural composition; AA, AC or CC) by 3 (communication medium) by 2 (map task) ANOVA. Dyad cultural composition and medium were between-subjects variables and map task was a within-subjects variable, with each pair receiving two scores for the two different maps.

There was a main effect of dyad cultural composition (F [2, 84] = 3.16, p < .05); culturally mixed pairs (AC) performed more poorly. Post-hoc LSD tests indicated that the difference between AA and AC pairs was significant (p < .05) and the difference between AC and CC pairs approached significance (p = .12). There was no overall effect of technology (F < 1, *ns*) and no technology by dyad culture interaction (F [4, 84] = 1.45, *ns*).

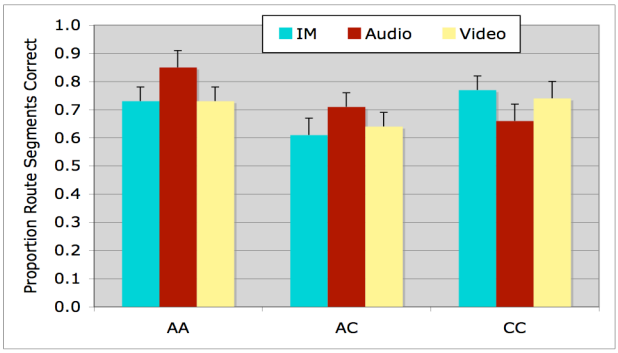

***Figure 5*. Route accuracy as a function of dyad cultural composition and communication medium (AA = American-American, AC = American-Chinese, CC = Chinese-Chinese)**

DISCUSSION

The findings from our experiment show that culture and technology have an interactive effect on dyad members' attributions during a collaborative task. The work thus extends previous studies (e.g., [31], [32], [41]) by demonstrating that culture and technology interact not only in shaping communication but also in shaping how people think about their collaborative performance. Below we discuss these findings and their implications for the design of CSCW systems to support cross-cultural collaboration.

Hypotheses 1, 2, and 4: The greater visibility of partners in the video condition reinforced the tendency of American participants to make more dispositional attributions in video and fewer dispositional attributions in the audio condition. For Chinese participants, greater visibility of their partner did not significantly alter their attributions, which were equally situational in both video and audio conditions. The absence of visual and auditory cues in IM reversed the attribution biases for both cultural groups: Americans made mostly situational attributions whereas Chinese made mostly dispositional attributions in IM. That finding seems to run counter to prior studies of cultural biases in attributions ([1]), however those studies had compared cultural biases in offline contexts without varying the communication medium. By looking at attributions across the three technologies (video, audio, IM) we can have a more complete picture of how cultural biases are affected by the technology.

Hypothesis 3: Attributions did not differ depending upon the culture of a person's partner. Neither Americans nor Chinese participants perceived culturally similar partners more favorably than they did culturally dissimilar partners, despite the fact that performance in cross-cultural dyads was worse than in same-culture dyads. That finding departs from prior research that has observed an ethnocentric bias among those having a shared cultural background or a shared social identity ([14],[28]). Methodological limitations might explain this finding: the effect of shared culture was assessed between subjects, however, to properly detect that effect a within-subjects design should be employed that allows the same participant to collaborate with a culturally similar and with a dissimilar partner separately on the same task. Additionally, in a university environment with a high population of Chinese students, the two groups intermingle daily and do share a super-ordinate "student" identity even though they differ on cultural identity.

An additional finding of note pertains to the third factor of "collaboration" attributions we found in this study. Traditionally, there have been two classes of attributions: dispositional ones that include various characteristics about the self and others, such as skill, ability, and personality, and situational ones that include impersonal forces that function as constraints on individuals' behavior ([1], [10]). We found a third class of attributions to causes that lie in the nature of collaboration, including one's own and a partner's ability to communicate and coordinate. The collaboration factor was separated from the dispositional factor to distinguish personality and affective states (e.g., mood) from skills that individuals can be trained to develop (e.g., collaboration skills). While differing from traditional attribution theory, the value of separating the collaboration factor is a finer-grained distinction in individuals' perceptions; future studies can look at how training or feedback mechanisms affect attributions, and which ones (dispositional ones vs. collaboration-related ones). Further research is needed to find whether a separate category of collaboration attributions will hold up for other types of tasks (eg.,25], [36]).

Consistent with prior research in team diversity and collaboration (e.g., [24], [38]), cross-cultural dyads performed worse than the culturally homogeneous dyads, Unless they are performing highly creative tasks, culturally diverse teams generally perform worse than homogenous ones (e.g., [24]). The map navigation task required less

creativity and more accuracy on the part of participants because there was a limited number of ways to navigate the maps.

Limitations and Future Research

The results we've presented provide initial insights into how culture and technology interact to shape attributional processes. Nonetheless, the generalizability of the findings is limited by several aspects of our research paradigm: we studied dyads, a very limited number of cultures, and for a limited task duration (about one hour). Also, the study's Chinese participants were Chinese students in the US who may not be representative of Chinese people in general. Future work will be needed to determine how well these findings generalize to larger teams from a greater diversity of cultures, and to longer-term real-world tasks.

The results also leave open some questions about how dyad members interacted in the course of doing the task. The nature of this interaction across different media may explain, at least in part, differences in attributional processes. We are currently in the process of coding the pairs' dialogues for instruction giving, situational awareness, feedback and other critical aspects of successful performance on the task in order to understand how communication influences attributional processes.

CONCLUSION

In this study we attempted to 'unpack' the effect of three kinds of CSCW technologies on the attributions that members with different cultural backgrounds make about their teams. Our results can help inform the design of technologies for cross-cultural collaboration: providing a visual view of partners did not always help maintain shared awareness for the different cultural groups. Instead we suggest that a capability for monitoring comprehension of partners' speech as well as actions can help teams with different cultural configurations communicate more efficiently and minimize attribution biases that can get in the way of successful collaboration.

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