

To Be Like You to Be Liked by You: Cultural Effects on Adjusting Awareness Information Gathering Behavior

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ABSTRACT

Behavioral accommodation, the adjustment of one's own behavior to match that of other people, is prevalent in human communication, but people differ in the extent to which they accommodate each other. This paper presents a laboratory study examining how cultural background affects behavioral accommodation in awareness information gathering behaviors. Results suggested that members of collectivistic cultures (e.g., China) adjusted their behaviors to match those of their partners, when they were working with someone from other culture, whereas members of individualistic cultures (e.g.: the United States) did not accommodate when in the same situation. Our results suggest that accommodation exists even in online collaborations where no linguistic elements are involved, but this existence is affected by one's cultural background.

Author Keywords

Accommodation; adjustment; culture; awareness information; liking.

ACM Classification Keywords

H.5.3. [Group and Organization Interfaces]: Computer-supported cooperative work.

INTRODUCTION

Accommodation behavior has been defined in various ways, but most of them refer to the process in which one changes one's verbal and nonverbal behaviors to match that of others [45]. It is an important factor in many aspects of human communication [15], because it can foster a positive interpersonal relationship [43], increase feelings of similarity, affiliation, rapport, and liking (e.g., [27]; for a review, see [29]). Behavioral accommodation can also sometimes make people more cooperative [21] and easily persuaded [49], and it can facilitate tasks like negotiation [32]. People also report that it is smoother and more

enjoyable to communicate with those who accommodate to match their linguistic style than with those who do not [44].

Behavioral accommodation is highly prevalent in everyday life. When interacting face-to-face, people accommodate each other in numerous aspects. Linguistically, communicators change their accents, speech rate, word choice, utterance duration and syntax to match those of a conversational partner [6, 12, 17, 18]. Communicators also modify nonverbal behaviors such as gaze or frequency of head nods, sometimes without even realizing it [14, 21, 25].

Compared to the large body of research on behavioral accommodation in face-to-face settings, fewer have investigated similar behaviors online. Although the lack of audio and visual cues limits the communication of nonverbal behaviors such as nodding, people still accommodate each other linguistically, in terms of word and phrase choices, especially those that express politeness or emotions [8, 36, 39, 40]. The extent to which online communicators accommodate each other's nonlinguistic behavior has been less studied, and is one of the goals of the current research.

While behavioral accommodation is common, individual level factors such as people's cultural background have been shown to influence the extent to which people accommodate [9, 16]. For example, in an online text-based brainstorming task, Wang et al. [50] found that Americans in same culture pairs (i.e., both from the same culture) were more responsive to each others' messages than Chinese participants in same culture pairs. In mixed culture pairs (i.e., participants were from different cultures), Chinese participants accommodated their partners' levels of responsiveness by increasing their responsiveness to match that of the Americans. However, there was no evidence that Americans reduced their responsiveness to accommodate their Chinese partners. van Baaren et al. [48] similarly report that Japanese participants adjusted their face-rubbing and foot-shaking behavior to match that of a confederate to a much greater extent than did American participants. These results suggest that there may be cultural differences in accommodation, though to our knowledge these differences have yet to be examined in the context of online non-linguistic behaviors, which is also one goal of the current study.

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In the current study, we are interested in examining whether and how people from different cultures accommodate each other in terms of a specific online nonverbal behavior: awareness information gathering behavior. Awareness gathering behaviors are the actions by which a person gains information about their collaborator's presence and activities [19]. For example, peeking in someone's office or checking their Instant Messaging status would be types of awareness information gathering behaviors. In our study, we examine awareness gathering in the context of a prototype collaboration tool called OpenMessenger [5], which allows geographically distributed collaborators to examine each other's task progress, while at the same time makes such behavior visible to the person whose awareness information is gathered as well. Because awareness information gathering behavior conveys certain communicative intentions (e.g., to initiate a conversation) even without words, it is an interesting arena for examining cultural effects on behavioral accommodation.

In the remainder of this paper, we first present the theoretical motivation for our study, and then outline our hypotheses and the experimental design we used to examine the effects of one's own and a partner's cultural background on adjusting one's awareness information behavior. As we will show in the results section, there are differences both in the rates at which people from different cultures perform awareness checks and in the extent to which they adapt their awareness checking behavior to match that of a partner from a different culture. We conclude with implications for theories of behavioral accommodation and designs of tools to support intercultural collaboration.

BACKGROUND

In this section, we review literatures in three fields: behavioral accommodation, cultural dimensions, and the awareness information gathering behaviors.

Behavioral accommodation

Behavioral accommodation is an important aspect of communication behavior. It has been labeled in various ways in different theories, like accommodation, mimicry, reciprocity, synchrony, or style matching [45]. Despite of the different foci on intentionality, and on verbal vs. nonverbal behaviors, in essence these terms all refer to a modification of one's behavior to match that of a partner. (for a review, see [45]). For this paper's purpose, we will refer to this type of adjustment as *behavioral accommodation*.

Behavioral accommodation in offline and online settings

Giles [17] defined accommodation as a process in which people reduce their communicative differences with their interactants and achieve a converging effect. It is highly common in everyday life. Chartrand et al. [14] proposed that it is so common that "people automatically behave as they perceive" (p. 334). Evidence abounds in the accommodation in face-to-face settings. People accommodate other's speech style [17], facial expressions

[1], postures and mannerism [27], idiosyncratic movements [2], and sometimes emotion and mood [42] as well.

Evidence also suggests that behavioral accommodation is prevalent in some other cultures apart from the American. For example, van Baaren et al. [48] found that both Japanese and American participants adjusted their own face-rubbing and foot-shaking behaviors to match those of a confederate (but to different extents).

Such accommodation does not only occur in face-to-face interaction, but also in online settings. Bunz and Campbell [8] investigated politeness accommodation in email use and found people reciprocated with politeness markers (e.g., phrases like "please" or "thank you") when they received it; and they tended to be more polite in replies when the received email contained structural politeness elements, such as use of salutation (e.g., Dear [recipient's name]) and closing remarks (e.g., "Regards" at the end of the email).

Riordan et al. [36] found that when conversing via instant messenger, interlocutors have a tendency to converge in terms of the length and duration of contributions, no matter whether they have interaction histories before.

Influencing factors of accommodation

Despite of its prevalence, people differ in the extents to which they accommodate due to a variety of factors. For example, Lakin et al. [28] found that, motivated by the desire of belongingness, an excluded member of a group accommodate more than an included one, and they are more likely to mimic an in-group member's behavior rather than an out-group one's.

The perceived social power difference between a target and oneself affects the extent to which people accommodate themselves in that people with lower social status are more likely to accommodate to those with higher status [17].

Miles et al. [35] found that the social impression makes a difference for accommodation as well, in that people are more likely to mimic a punctate partner rather than a tardy one.

Previous interaction history makes a difference too. Riordan et al. [36] contrasted friends and strangers and found that the linguistic convergence is more manifest in friend-pairs than in stranger-pairs.

Giles [17] suggested that people sometimes over-accommodate due to their subjective sense of the need to accommodate. However, these accommodative acts may miscarry the intention when perceived by the target of accommodation. It's complicated in that it depends on whether you are in the out-group or not (see more details later).

Giles [17] also proposed that people sometimes choose to non-accommodate or under-accommodate to diverge their behaviors from other interactants. Symmetrical accommodation strengthens interpersonal relations; by the

same token, a mutually non-accommodative interaction is likely to worsen those relations.

Social consequences of behavioral accommodation

Lakin et al. [29] cited evidence in evolutionary psychology [11] that accommodation or mimicry has its evolutionary significance, in that by mimicking other people's behavior, one is more likely to avoid being ostracized from a group, which, in an environment that was difficult for an individual to navigate, was a crucial factor for survival. They [29] further proposed in the current society, accommodating other people verbally and nonverbally also serves as glue for social relations in that it fosters positive interpersonal likings.

The bi-directional relationship between liking and behavioral accommodation has received much attention from research. Byrne [10] argues that this happens through a similarity-attraction link: People prefer others who are like themselves more so than those who are not. Quite a few studies support this conclusion. For example, Chartrand and Bargh [13] found that people developed more liking toward strangers who mimicked them more. Hove and Risen [22] also found that people felt more affiliated with strangers who synchronized their movements with themselves than those who did not. Buller and Aune [7] found that speech rate similarity could increase intimacy and immediacy, which was, in turn, linked to greater compliance in the context of help requests.

Scissor et al. [38] measured repetition of words, word phrases (excluding numbers, connecting words, etc.) and abbreviations to examine the linguistic mimicry in IM chat. In their experiment, participants who mimicked each other in the same chat session trusted each other more than those who mimicked less.

However, there is also evidence suggesting the liking developed from behavioral accommodation only stands when the interactants have the same group identity; in other words, such a correlation does not hold if the mimicker thinks the mimickee is an out-group member. Likowski et al. [30] found the mimickee liked the in-group mimicker more than the out-group one, even though the two were both mimicking the behavior of the mimickee. The mimickee actually liked the out-group member who does not mimic more than the one who does mimic.

Behavioral accommodation, especially language style matching, according to Ireland and Henderson [25], may also lead to impasse in negotiations, because negotiators were less focused on the task itself. They also found accommodation at different stages of a negotiation task matters, in that accommodation in later stages predicts a more positive relationship than that in earlier stages.

In another study about online communication, Scissor et al. [39] found that certain types of similarity from accommodation may lead to lower level of trust. Those

similarities include more use of negative emotions and words relating to money.

In general, accommodation prevails in both online and offline settings, in both verbal and nonverbal behaviors. In some cases, accommodation between people may increase the affiliation, rapport, and social attraction they feel from each other; but in other cases, especially when the accommodator is perceived as an out-group member or when they mimic negative emotions, accommodation may lead to the socially negative consequences. However, most of the studies above focus on the North American population instead of people from other cultures, which, as van Baaren et al. [48] and Wang et al. [50, 51] have suggested, makes a difference when it comes to behavioral accommodation.

Cultural dimensions

Cultures differ from each other in several important ways. Cultures vary along the dimension of individualism and collectivism (e.g., [22]). Members of individualistic cultures are more focused on self and their direct family, whereas members of collectivist cultures are more focused on the groups to which they belong.

A related cultural difference is the emphasis a culture places on maintaining social relationship with others versus completing task efficiently. Triandis [47] found people from individualistic cultures (e.g., United States, Canada) focus more on task efficiency than on relationship development and maintenance. When facing conflicts between task completion and interpersonal relationship issues, they tend to complete the task rather than maintain their relationships. In contrast, members of collectivist cultures (e.g., China, Japan) prioritize relationship maintenance more than task efficiency. This difference is also reflected in various workplace settings [20, 24, 26, 37, 38, 41, 46, 47].

Individualism and collectivism are also related to different chronically dominant self-construals in different cultures. Markus and Kitayama [33] contend that people in individualistic cultures have a more independent self-construal as they are more likely to identify themselves as individuals with their own significant inner attributes, whereas people in collectivistic cultures have a more interdependent self-construal as they are more likely to identify themselves as part of certain groups and/or families.

Wang and colleagues [50, 51] found that Chinese participants are more likely than Americans to change their behavior to match that of other cultures. In their study, American participants generated significantly more conversational content than Chinese participants when they were paired with someone from their own culture. However, Chinese participants became significantly more talkative when they were paired with an American collaborator than when they were paired with a Chinese

one, whereas Americans did not vary in talkativeness as a function of the cultural background of their partner. This suggests that Chinese participants are more likely to accommodate than American participants.

van Baaren et al. [48] proposed a similar hypothesis that people with an interdependent self-construal are more prone to mimicry than those with an independent self-construal. In their experiment, in which mimicry was operationalized as foot shaking and face-rubbing, they found that people who were primed to have a more independent self-construal conducted significantly less mimicry than people in the control session (not primed) and even more so than people whose interdependent self-construal was primed. They also replicated the same experiment on Japanese and American participants, whom they considered to have a chronic interdependent and independent self-construal, respectively. The results showed that Japanese performed more mimicry than Americans, further supporting the cultural effects on behavioral accommodation.

Accommodation in Awareness Behaviors

While previous work on behavioral accommodation has looked at verbal language and nonverbal face-to-face behaviors, we conjecture that other types of behaviors that occur in interaction may also lend themselves to accommodation. In particular, we focus on actions people take to maintain awareness of what their partners are doing [19], such as peeking into someone's office in face-to-face settings or seeking details about others online.

Mutually visible awareness information gathering behavior helps time the initiation of interaction, in that even if the person whose awareness information is being gathered is busy and not available for most interruptions, he/she has relative more control over the incoming communication requests – he/she can choose to respond to specific people in certain cases (e.g., urgent task) even if he/she is busy. However, since such behavior is visible to both parties at the same time, it bears the social cost of annoying or interrupting people [4].

In a previous study, Bi et al. [3] found that awareness information, due to its tradeoff between task performance and relationship maintenance, is gathered differently in terms of frequency for Americans and Chinese participants. Specifically, Chinese participants conducted significantly fewer awareness checks than their American counterparts within a certain period of time. This was true in stranger as well as friend pairs. Bi and colleagues reasoned that this difference stemmed from cultural differences in task vs. relationship orientation [38]. Because those of Chinese cultural background tend to be more relationship-oriented than those of American background, Chinese participants were less likely to intrude on their partners to gather awareness information even though it would have benefited their personal task performance. In contrast, Americans, who tend to be more task-oriented, conducted awareness

checks because they were important for getting the work done.

Bi et al.'s [3] study compared culturally homogeneous pairs; in other words, the collaborators were both from the same culture, either American or Chinese. Based on the literature review about behavioral accommodation, we asked whether participants would change their behavior when they are paired with someone not from their culture.

THE PRESENT STUDY

In regards to the preceding review and questions, we proposed a series of hypotheses and ran a laboratory experiment to answer them. This section describes the specific hypotheses, research questions, and the methodological details.

Hypotheses

The first hypothesis addresses the cultural effect on the awareness information checks. Based on the previous work, we believed that awareness checks would be more frequent among Americans than among Chinese, because the task-oriented cultural background will encourage the Americans to conduct the awareness checks, which is beneficial for task completion, whereas the relationship-oriented cultural background would discourage the Chinese from doing so, since they were aware that the collaborator could see their awareness checks and might be annoyed if those checks were too frequent. We therefore hypothesized that:

H1: American participants will conduct awareness checks more frequently than Chinese participants.

The second set of hypotheses address the effects of culture on behavioral accommodation of participants' awareness checks. Previous work [50, 51] has shown that Chinese are more likely to adjust their behaviors than Americans, because the interdependent self-construal makes the former more sensitive to the environmental cues than the latter, and therefore are more likely to respond to it by adjusting their own behaviors. Combining with the results from the study about awareness checks difference between American and Chinese pairs that Americans conduct more checks than Chinese do [3], we hypothesized that:

H2a: Chinese participants will conduct awareness checks more frequently when they work with an American partner than when they work with a Chinese partner.

H2b: American participants will conduct awareness checks less frequently when they work with a Chinese partner than when they work with an American partner.

H2c: The adjustment in the awareness checks frequency will be bigger for Chinese participants than for American participants.

The last hypothesis deals with the correlation between the behavioral accommodation level and the social liking between collaborators. As reviewed previously, past research have indicated at least two possibilities, that

behavioral accommodation either increases the liking or decreases it. To date, most studies have indicated that a higher level of accommodation will induce the target of accommodation to like the accommodator more. Therefore we hypothesized that:

H3: The more similar the awareness checks frequencies are between the collaborators, the more they will like their partner.

We were also interested in knowing when this adjustment, should it exist, starts, and to what extent it affects the awareness information gathering behaviors of Chinese participants. Therefore we asked:

RQ1: How does accommodation, if it occur, vary across the time of the interaction?

Design

We used a between-participant design, in which we recruited participants from both American and Chinese cultures separately, and paired them with each other. Each participant had the same chance to be paired with an American or a Chinese, and thus we had three different cultural compositions: American-American, Chinese-Chinese, and American-Chinese pairs.

We had those participants work together on a series of tasks that were similar in nature; it usually took them around one hour to complete the whole experiment.

Participants

We recruited 50 participants at a large university in the northeastern United States (36% male; 52% Americans, 48% Chinese; 28% undergraduates, the rest were graduate students). The Chinese participants were all international students who were born in Mainland China, and had been in the States for fewer than five years.

Those 50 participants were formed into 25 pairs, among which there were 9 American-American pairs, 8 Chinese-Chinese pairs, and 8 American-Chinese pairs. We also made sure they were paired with someone of their same academic level (i.e., undergraduate and undergraduate, graduate and graduate) to ensure equal power status. All the participants had no previous interaction before the experiment.

Tasks and tool

The task used for this study was designed to replicate a real-world scenario in which a person has shared and individual tasks that are interdependent in a complex way, and in which incentives for shared and individual tasks are mixed. The goal of the task was for the participants to collaborate on completing five jigsaw puzzles on the computers, each of which was further divided into six smaller sections that were completed one by one. Each participant needed to finish three of the six sections.

The puzzle section was solved in a “puzzle window” (see Figure 1), which consisted of the puzzle itself and a space

for the pile of puzzle pieces. Participants solved the puzzle sections by dragging the pieces from the pile area (right) and snapping them into the grid on the left.

To create interdependency in the task, participants could only start a new puzzle section after the partner had also finished his/her own section. Those who completed a section faster than their partner were offered an opportunity to earn additional points – and a potential cash bonus for themselves – by accessing and playing solo “shape games”.

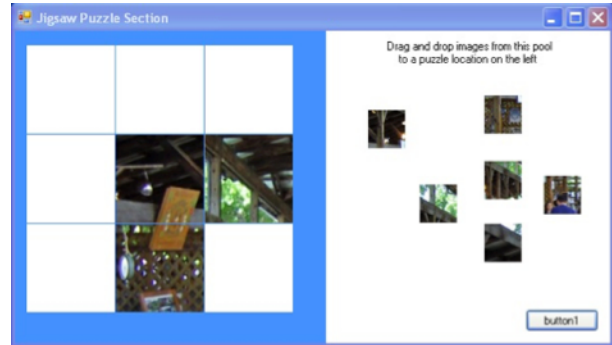


Figure 1. Puzzle interface, with the puzzle section (left) and the pile of pieces (right)

Every time the participants finished a puzzle section faster than their partner, a dialog box popped up and asked them whether they wanted to play the shape game or not with options of “Yes” and “No”. If they chose “Yes”, they proceeded to the shape game; if they chose “No”, no points were deducted, but they were not able to play any shape games until after the next time they finished the puzzle section faster than their partner.

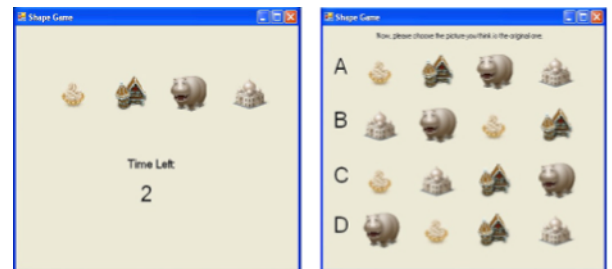


Figure 2. Shape game interfaces, with the initial sequence (left) and the set of choices (right)

Participants were shown a sequence of ordinary objects when they played the shape game. This sequence disappeared in 5 seconds. The participants had to identify the original sequence from four options (see Figure 2) to earn the points. For each shape game successfully completed, the participant got 1 point; but if their partner finished the jigsaw puzzle section while the participant was still playing a shape game, the participant lost 5 points. Points were used to determine the cash bonus received at the end of the experiment. In this way, there was a clear incentive to use awareness information to estimate available time for shape games.

To gather awareness information about their partner's task progress, participants used OpenMessenger (OM), a prototype developed by Birnholtz et al. [5], to view the number of puzzle pieces their partner had correctly placed.

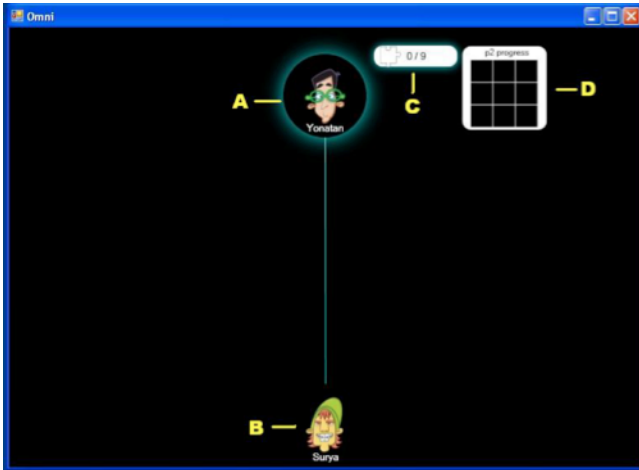


Figure 3. The projected awareness window including: (A) the partner's avatar, (B) the participant's avatar, (C) the number of correctly placed piece puzzles, and (D) the location of correctly placed puzzle pieces

The number of correctly placed puzzle pieces was an indicator of how far along one's partner was on the puzzle task and how much time the participant had to play shape games. By hovering the mouse cursor over the avatar on top, which represented their partner, participants would see the number of puzzle pieces correctly placed by the partner. This information was used to help the participant decide how much left they had to play shape games (see Figure 3). Participants in the shape game could gather this awareness information whenever they needed to determine more accurately whether he/she should play another shape game.

Two paper-based questionnaires were administered in the experiment. The pre-experiment questionnaire collected participants' experience in IM usage. The post-experiment questionnaire asked about the participants' workload, impression about the partner, individualism/collectivism, evaluation of self-performance, task/relationship orientation, and demographic information.

Procedures

Participants came to the laboratory alone and were paired up with another participant. Before the experiment started, we made sure that the participants had never met each other before. Then we had each participant write down his/her last name and place of birth (including the city and country) on a piece of paper, and exchange this information with each other, so they knew whether their partner shared the same cultural background with themselves.

Participants were then seated in two corners of the laboratory, facing different directions and separated by dividers to make sure they could not see each other. They

wore noise-cancelling headphones to reduce ambient sounds.

The participants were first shown a short instructional video introducing the puzzle, shape game tasks and the financial incentive. The video also explained the scoring scheme and its connection to the cash bonus. The participants were told explicitly that they would earn 1 point for each shape game they played correctly and that a wrong answer would mean a 1-point loss. Most importantly, if their partner finished their puzzle section while they were still playing a shape game, they would lose 5 points. The final total points would be used to determine cash bonuses, with more points meaning a larger cash bonus.

This scoring scheme was designed to motivate participants' awareness information gathering behaviors, as they needed to get information about their partner's progress on the puzzles in order to gain more points and avoid losses. In other words, it was to the participants' advantage to know how far along their partner was on the puzzle task, so they could estimate whether there would be enough time to play shape games to earn points without being cut off and thereby losing points. They were instructed to use OM to collect such information.

After the instructions but before starting the tasks, participants completed a practice session, including a simple puzzle section and one shape game that asked them to gather awareness information from their partner, to familiarize themselves with the game rules and the OM system.

Measures

Awareness checks

Counts of awareness checks per puzzle section were extracted from the OM log files. Because the raw number of checks was correlated with the amount of time available to participants for these checks, we first used the logs to determine how much time was available. Participants only had time for shape games, and thus only had reason to perform the awareness checks, if they finished their section of the puzzle before their partner did. This means that only one of the two participants could engage in shape games in a given puzzle section. We determined which partner had time for shape games, and how much time was available, for each section. We then used the total amount of time available to the participant across all puzzles and sections as the denominator to compute our rate of awareness checks. The resulting value was positively skewed so we used a log transformation prior to analysis.

Liking

We adopted the sub-scale from the Interpersonal Attraction Scale [34] to measure the social attraction of participants. Scores on five questions pertaining to participants' desire to interact socially with their partners (e.g., "I would like to have a friendly chat with him/her") were averaged to create a social attraction measure (Cronbach's $\alpha = .87$).

RESULTS

H1 predicted that Americans, being more task-oriented, would conduct the awareness checks more frequently than the relationship-oriented Chinese. We tested this hypothesis using a mixed model ANOVA in which participants were random factors, and puzzle number, participants' own cultural background, and partner's cultural background were fixed factors. Note that mixed method analyses can result in non-integer degrees of freedom [31]. We found that, in the overall sample, one's own cultural background affects the frequency of awareness checks, in that Americans ($M = 2.39$, $SE = .16$) conducted awareness checks significantly more frequently than their Chinese counterparts ($M = 1.85$, $SE = .16$; $F [1, 51.32] = 5.548$, $p = .02$). This is consistent with previous findings that awareness checks are more frequent in American participants than in Chinese, probably because the American culture emphasizes task completion and performance more so than Chinese culture, which prioritizes relationship maintenance. Therefore H1 is supported.

H2a predicted that Chinese participants would conduct awareness checks more frequently when they were paired with an American than when they were paired with a Chinese, while H2b predicted that Americans would conduct less awareness checks when their partner was Chinese than when the partner was American. We tested these hypotheses using a mixed model ANOVA of the same form as for H1 above. As Figure 4 shows, we found that Chinese participants paired with an American partner conducted significantly more awareness checks ($M = 2.19$, $SE = .26$) than those who had a Chinese partner ($M = 1.52$, $SE = .19$; $F [1, 51.32] = 4.26$, $p = .04$), but did not find a significant difference for the American participants. Therefore H2a is supported but H2b is rejected.

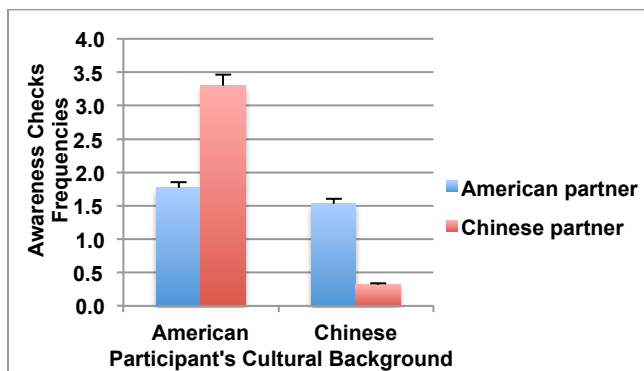


Figure 4. Average awareness checks frequency for Americans and Chinese with different partners

H2c predicted that the Chinese participants would accommodate more so than Americans in culturally heterogeneous pairs (i.e., AC pairs). According to H2a and H2b, Chinese did change whereas Americans did not, and we can conclude H2c is also supported, in that Chinese showed accommodation, whereas Americans did not.

H3 predicted that the more one accommodate the partner, the more the partner would like the participant. The bivariate correlation analysis shows there was a negative correlation between the difference of the awareness checks and the social attraction that approached significance ($r [44] = -.27$, $p = .08$), meaning if the difference was smaller, and the two collaborators were similar in their awareness checks frequency, they would tend to like each other more. This offers some preliminary yet insufficient support for the argument about accommodation leads to more liking.

The literature also suggests an important boundary condition for the liking and behavioral accommodation is the group identity. Therefore it is likely that the accommodation has different effects for groups with different cultural composition. We examined the correlation between liking and cultural composition in the sub-groups (AA, CC and AC), but did not find any significant correlation or trend.

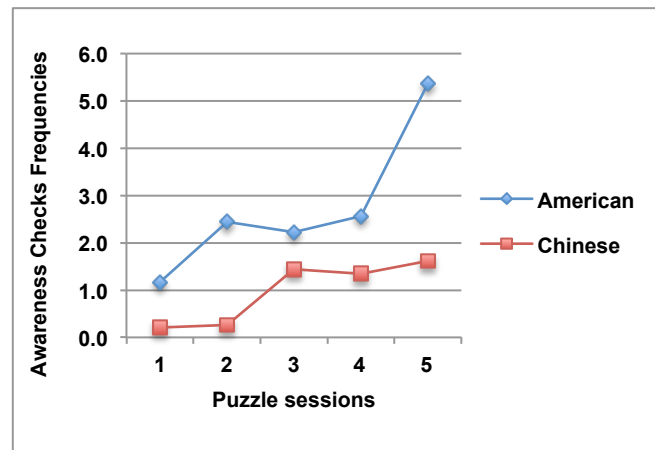


Figure 5. Average awareness checks frequencies for Americans and Chinese in each puzzle

RQ1 asked how the accommodation plays out across time. To examine this, we first looked at the data by running univariate ANOVAs for the five puzzle trials respectively. As Figure 5 shows, in the first puzzle, Americans ($M = 2.10$, $SE = .27$) conducted awareness checks more frequently than Chinese ($M = 1.34$, $SE = .25$) ($F [1, 41] = 4.36$, $p = .04$). The same thing occurred in the second puzzle as well: American's ($M = 2.46$, $SE = .23$) awareness checks frequency was still significantly higher than the Chinese's ($M = 1.37$, $SE = .26$) ($F [1, 40] = 9.80$, $p < .01$). However, from the third puzzle onward, the awareness checks frequency did not show a significant difference between cultures; neither did the Chinese participants surpass their American counterparts in the later puzzles ($F [1, 38] = .28$, *n.s.* for the third puzzle; $F [1, 40] = 1.46$, *n.s.* for the fourth puzzle; $F [1, 39] = 1.31$, *n.s.* for the fifth puzzle). So we can conclude that such accommodation allows the Chinese user to adjust their awareness checks frequency to a similar level of Americans.

To further examine the effects of collaboration time on specific cultural groups, we ran a univariate ANOVA for the four subsets of sample separately (AA, CC, AC, and CA pairs, the first letter in each group representing the participant's background we examined). As Figure 6 shows, American-American pairs did not increase their awareness checks across time. This is also true for Americans who were paired with a Chinese partner, as well as Chinese-Chinese pairs. However, for Chinese participants with American partners, puzzle session has a main effect: in the first ($M = 1.30$, $SE = .34$) and second puzzles ($M = 1.42$, $SE = .40$), the awareness checks frequency are significantly lower than the ones in the next three puzzle sessions.

This result suggests Chinese participants who were partnered with an American increased their awareness checks frequency as they progressed on the task, and this increase only exists in this particular subset, not others.

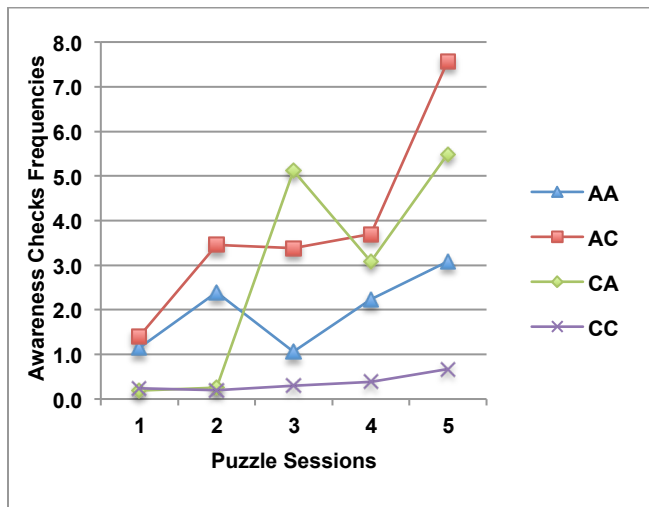


Figure 6. Average awareness checks frequencies for different groups in different puzzle sections

We also looked at only the culturally heterogeneous pairs only, and we found that there is no difference between American and Chinese participants from the first puzzle session. This suggests that the change started in the very beginning of their collaboration; a reasonable assumption is that it might have occurred within the three puzzle sections during the first session. However, due to insufficient data in the first session, we were unable to confirm this possibility.

DISCUSSION

In this study, we found that there are cultural differences in the awareness information gathering behavior between Americans and Chinese, in that (1) in general, Americans conduct awareness checks more frequently than Chinese, and (2) Chinese accommodate more than Americans when they work with someone from a different culture. We also found a trend between social attraction and accommodation that the more alike the participants' awareness checks frequencies are, the more likely they find each other

socially attracted, even though they did not know each other before.

The finding about cultural difference in the adjustment of awareness checks frequencies provides empirical evidence about the existence of behavioral accommodation online, in a nonverbal context. Previous research has identified accommodation in word choice and other linguistic behaviors [36, 39, 40] via email and instant messenger, but not in nonverbal ones. Our study suggests it does exist in awareness information gathering behavior, but is only conducted by Chinese participants. This finding is also consistent with previous work that suggest [50, 51] Chinese, being more sensitive to the environmental cues, are more likely than Americans to accommodate when working with someone from a different culture.

We also found very preliminary evidence for the correlation between liking and behavioral accommodation in that people tend to like those who are in behavioral synchrony with themselves than those who are not. This is not only consistent with some previous literatures about such a positive correlation, but also indicates that in a work-related environment, unlike negative emotions or money-related words in Scissor et al's [39] study, more similarity in awareness information gathering behavior tend to foster positive social consequences rather than negative ones. On one hand, for designers, it offers more motivation to engineer the awareness tools in a way that visualizes the difference and encourages the collaborators to minimize such difference by accommodating each other; on the other hand, it suggests that for two cultures that also differ in awareness checks frequencies but may be less likely to accommodate with each other, such behavioral difference of awareness checks may lead to problems involving distrust, dislike and feeling not affiliated.

Limitations and future directions

One limitation of the study is that it has a relatively small sample size ($n = 50$). With more data, we might be able to find more robust evidence for the correlation between behavioral accommodation and liking of one's collaborator.

Also, our experiment was conducted in the States, which may introduce the confounding factor of environment. If the Chinese participants were unconsciously influenced by the notion that they should "do as the Romans do when in Rome", their behavioral accommodation may be interpreted as partially influenced by the location and cultural environment they are in. It would be helpful if this experiment were replicated in a Chinese-dominant context to eliminate the possible confounding factors of environment.

CONCLUSION

In summary, although previous finding has suggested that Americans conducted awareness checks more frequently than Chinese, we found that, when paired with an American, Chinese participants adjusted their awareness

information gathering behavior to match that of their collaborators'. It is consistent with the literature that suggests Chinese, being more sensitive to the social cues, are more likely to accommodate their behavior than Americans. The study also examined the liking generated from the behavioral accommodation and offers preliminary yet insufficient evidence for such a correlation.

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