

# Adapting a Persuasive Conversational Agent for the Chinese Culture

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**Abstract**—The design of an embodied conversational agent that promotes physical activity to young Chinese adults living in the United States is described, along with specific cultural adaptations performed to tailor the agent to Chinese culture. Results of a pilot study comparing the Chinese exercise coach agent to another adapted to American culture demonstrated that participants found the Chinese agent more interesting, but were more persuaded by the American agent to change their attitudes towards exercise. Overall, participants reported high levels of satisfaction with and trust in the agent, across both conditions. Qualitative analysis of interviews was carried out to examine participants’ overall impression of the experience, and their perceptions of the cultural adaptations. We discuss possible explanations of our results, and propose future improvements for culturally adapted conversational agents, tailored to the Chinese community.

**Keywords**—*embodied conversational agent; virtual agent; physical activity; regular exercise; persuasion; Chinese culture; new immigrants; cultural adaptation*

## I. INTRODUCTION

Regular physical activity has been associated with better health, improved functioning of cardiovascular and respiratory systems, and reduced risk of cardiovascular diseases and certain types of cancer [1, 2]. In response, the U.S. Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine have published guidelines recommending minimum levels of physical activity for all adults [3]. However, only 34% of Chinese immigrants to the U.S. meet these recommendations: a percentage that is significantly lower than other groups, including Mexicans and Filipinos (52%), and Caucasians (47%) [4]. This problem exists in other Chinese immigrant populations as well. For example, only 12% of young Chinese adults in Hong Kong reported exercising 3 to 4 times a week, and over half reported no regular physical activity at all [5, 6].

Acculturation may improve the physical activity behavior of Chinese immigrants. One study found that the percentage of Chinese immigrants meeting the recommended leisure-time physical activity recommendations increased significantly by each immigrant generation, from 20% among the first generation to 32% among the third

generation adults [4]. Yet, this number is still lower than that of the other minority groups in the United States.

To help address these issues and increase the level of physical activity among Chinese immigrants, especially first generation immigrants whose levels of physical activity are the lowest [4], we are developing an embodied conversational agent to promote physical activity among young Chinese adults living in the U.S. Embodied conversational agents are animated computer characters that use speech, gaze, hand gestures, and other non-verbal behaviors to simulate face-to-face conversation with a human counselor. The conversational agent can use a range of persuasive argumentation and behavior change techniques to motivate individuals to exercise. We have successfully developed and evaluated several such “virtual coach” systems for the U.S. Caucasian and Latino cultures [7, 8], but our current focus is on the cultural adaptation of these systems for the Chinese immigrant population. Our approach is to develop two systems in parallel: one is adapted to mainstream American culture, and the other is particularly adapted to Chinese culture, targeting new young immigrants who have moved to the United States after adolescence.

Cultural adaptation is important in health education interventions. The aim of applying cultural adaptation is to evoke a positive affiliation from target users, as well as to maximize persuasion and behavioral change [9]. Past studies have shown strong evidence that African American and Latino populations in the United States prefer the delivery of health information tailored to their culture or ethnicity, particularly in computer-mediated communications [10]. For example, a study conducted by Herek et al. [11] found that African Americans rated a culturally-tailored educational video as more credible, better in quality and more favorable overall, compared to a non-tailored video, and rated the non-tailored video even lower when it was delivered by a Caucasian announcer. In terms of patient-provider interaction, Sue et al. [12] found that patients prefer health counselors of the same cultural or ethnic background, due to the perception of shared cultural values.

However, very few studies have investigated cultural adaptation targeting Asian immigrants, specifically Chinese immigrants in the United States. Chinese immigrants, being the largest Asian ethnic group in the U.S., represent 4.9% of the foreign-born population [13]. Therefore, it is of great

social and scientific importance to study the impact of cultural adaptation of health interventions for this population.

In this paper, we present the design and evaluation of a culturally adapted embodied conversational agent system that promotes physical activity for young Chinese adults living in the United States. We hypothesize that:

H1: Chinese participants would have more positive attitudes towards exercise after interacting with a culturally adapted exercise coach agent compared to a non-adapted agent.

H2: Participants' level of acculturation (high vs. low) would interact with the cultural adaptation of the exercise coach agent (Chinese vs. American) on the agent's ability to change their attitudes towards exercise.

## II. RELATED WORK

Cultural adaptation is an important area in human-computer interaction (HCI) research, especially research related to conversational agents. Past studies have demonstrated that users prefer a virtual agent tailored to their own culture or ethnic background. Several studies have looked at the effects of culturally tailored virtual agents on users' preferences and attitudes [14, 15, 16]. Results have shown that people prefer a virtual agent specifically designed to resemble their own culture [17]; and they are more likely to change their behavior based on advice from a virtual agent whose ethnic background is similar to theirs [18]. However, these conclusions might be context dependent; and under certain circumstances, people might be more easily persuaded by an agent of a different race or gender [19].

Research also suggests that either perceived or actual similarity could be a major predicting factor of the level of user engagement in, trust in, and overall liking of a virtual agent. Additionally, users are more likely to accept the arguments of an agent exhibiting similarity with them [20]. Behrend and Thompson [21] looked at the effects of similarity in both appearance and behavior, and found that users learned better from a computer agent that was similar to themselves during an online training program. Zhou et al. [22] found that perceived similarity to a hospital discharge nurse conversational agent was significantly associated with liking and trusting the agent, with a desire to continue, and with maintaining a working alliance with the agent, in a randomized clinical trial involving more than 700 hospital patients.

Incorporating cultural tailoring into health and behavior change interventions has been shown to be effective. Spence et al. [10] showed that African Americans who identified more strongly with African American culture, expressed a significant change in behavioral intentions, when responding to a social media page with an African American avatar with high ethnic identity delivering health-related messages. Studies that specifically looked at culturally tailored virtual agent systems revealed an increase in the agent's ability to persuade users for a positive behavioral change. Yin et al. [23] developed a bilingual conversational agent system to promote exercise in elder Latino adults. Results showed that the tailored cultural congruity increased the empathy

between participants and the agent, and participants' exercise level increased after using the system.

A few studies have looked at cultural adaptation with Asian populations. Choi et al. [24] examined the efficacy and acceptability of a culturally adapted Internet-delivered depression treatment program with Chinese Australians, and found significantly reduced symptoms of depression among participants who received the tailored treatment. Other research also demonstrated the feasibility of culturally adapted interventions with other Asian ethnic groups, such as a smoking cessation intervention tailored for Korean immigrants in the United States [25]. However, there have been very few culturally tailored health interventions specifically targeted at Chinese immigrants in the United States.

## III. DESIGN OF A CULTURALLY ADAPTED SYSTEM FOR EXERCISE PROMOTION

To study the effects of cultural adaptation of a conversational agent system on its ability to persuade young Chinese adults to exercise regularly, we designed two prototype exercise promotion systems, each with a conversational agent representing a distinct culture (American vs. Chinese). The prototype was designed to engage users in a single conversation that lasted approximately 20 minutes, starting with social chat, followed by a persuasive discussion about the benefits of regular exercise and ways to overcome common exercise barriers. The agent then proposed various exercise options tailored to the targeted culture and provided the participant with a viable plan to get started with exercise at the end of the session.

Our conversational agents speak using synthetic speech, synchronized with a variety of nonverbal behaviors generated using BEAT [26], including facial displays of emotions such as happiness and concern, hand gestures, body posture shifts, gaze shifts, eyebrow raises, and head nods. Users contribute to the conversation by selecting utterance options from a multiple-choice menu on the screen, updated at each turn of the conversation. The agents were deployed on a standard, touch-screen desktop computer.

### A. Culturally Adapted Virtual Exercise Coach

We used the same English-speaking animated character for both systems, but with different names, clothing, and background scenes, tailored to American and Chinese cultures, respectively. Elsie, situated in a room resembling a typical living room in the U.S., was designed to represent American culture (see Fig. 1). Meimei, situated in a room with interior design elements drawn from traditional Chinese culture (in terms of floor texture and color, furniture, walls, and the decoration painting), was designed to represent Chinese culture (see Fig. 2). Informed by previous studies that demonstrated cultural differences in the use of nonverbal behaviors [27], Elsie was also designed to use more hand gestures throughout the interaction. We designed the agent to only speak in English, as our target users were Chinese individuals currently living in the U.S.

### B. Culturally Adapted Dialogues

To inform our development of culturally appropriate dialogues for exercise promotion, we adopted Hofstede's cultural dimensions theory [28]. The theory proposes six dimensions of culture and describes how these cultural dimensions relate to personal values and behaviors. The American and Chinese cultures noticeably differ in five dimensions: (1) power distance: the extent to which less powerful individuals in a society accept and expect the power to be unequally distributed; (2) individualism vs. collectivism: individualism is the belief that individuals consider personal needs as more important than the needs of the group they belong to; collectivism is the belief that individuals consider the needs of the group as more important than personal needs and they are expected to take care of other group members; (3) uncertainty avoidance: to what extent individuals tolerate uncertainty and anxiety; (4) long-term orientation vs. short-term orientation: a preference for attaching importance to - and sacrificing the present for - the future (long-term orientation) vs. a preference for attaching importance to the present without considerations of future consequences (short-term orientation); and (5) indulgence vs. restraint: to what extent individuals are willing to control personal desires and impulses [28].

Accordingly, we adapted the conversational agent's persuasive dialogue in these five dimensions. As shown in Hofstede's research, Asian countries score higher in power distance compared to Western countries [28]. This suggests Chinese people tend to expect their society to be hierarchically structured. Thus, in the Chinese-adapted system, we increased the authority of the conversational agent by framing the agent's exercise recommendations with phrases like "scientists have recommended," and by constructing dialogues with words invoking necessity, such as "should" and "have to". On the individualism-collectivism front, the U.S. is considered highly individualistic, whereas China endorses strong collectivist values [28]. Therefore, the American-adapted agent puts an emphasis on how exercise can help users improve their personal health and life quality. In contrast, the Chinese-adapted agent encourages users to exercise with close friends and emphasizes the potential positive effects of their activities on their family members. It is also shown in Hofstede's research that China is low in uncertainty avoidance [28], suggesting that Chinese people tend to be more pragmatic and tolerant of changes than Americans. Accordingly, we developed two different types of exercise plans to help users get started with exercise, with step-by-step recommendations in the American-adapted system and a year-long plan in the Chinese-adapted system, respectively. China is also considered a long-term oriented country, with a tendency to defer gratification of natural human desires, while Americans tend to indulge themselves in life, without considerations of future consequences [28]. Informed by these observations, the Chinese agent emphasizes the importance of persistence and the long-term benefits of regular exercise, whereas the American agent focuses on the fun side of regular exercise, and how regular exercise helps people enjoy their life.



Figure 1. An exercise coach agent adapted to American culture.



Figure 2. An exercise coach agent adapted to Chinese culture.

In addition to our adaptation of Hofstede's framework, we tailored the social chat at the beginning of the interaction to culture-specific topics, in order to build rapport with users. For example, the American agent talks about local sports teams and recent basketball/football games, whereas the Chinese agent asks about the Chinese Lunar New Year, Chinese traditions, and current trending Chinese TV shows. We also adapted the exercise suggestions to the targeted cultures. For example, the American agent suggests hiking, cycling, and weightlifting as examples of simple exercises, whereas the Chinese agent proposes badminton, jogging, and aerobic exercises, all considered popular exercise options among young Chinese adults. When describing these options, accompanying images were shown by the agent to amplify the effects of the cultural adaptations (see Fig. 3-4).



Figure 3. The American agent suggesting cycling as a possible option of simple exercise.

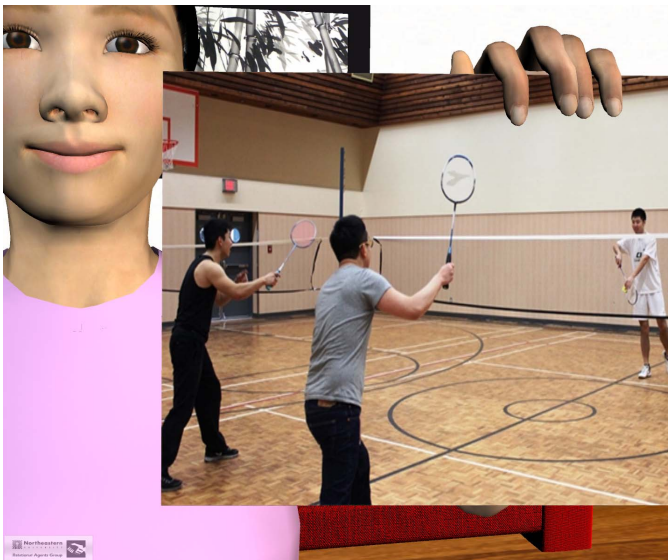


Figure 4. The Chinese agent suggesting playing badminton as a possible option of simple exercise.

#### IV. EVALUATION STUDY METHODS

We designed a between-subject pilot study to examine the impact of the cultural adaptation of the conversational agent system on its ability to change attitudes towards physical activity among young Chinese adults in the United States. In this study, participants were randomized into one of two study conditions, either interacting with a virtual exercise coach adapted to the Chinese culture, or with one adapted to the American culture. Participants' attitude towards regular exercise was measured before and after their interaction with the agent, in order to determine the level of persuasion.

#### A. Participants

We recruited a total of 49 Chinese participants, 46.9% male, aged 19 to 34 years old (mean=26.1, SD=3.6), 85.7% with an education level of college graduate or higher, and all with high level of computer literacy. All participants are able to speak and read English, have been born in China, moved to the U.S. at least by the age of 16, and have lived in the U.S. for at least six months (the average time in the U.S. was 2.8 years, SD=1.8 years). Twenty-five of them were randomized into the Chinese agent condition.

#### B. Measures

Participants' level of acculturation and social distance towards the U.S. and Chinese cultures were assessed by an adapted version of the American and Puerto Rican Cultural Involvement Scale [23, 29].

Participants' attitudes towards exercise were evaluated by a ranking task, consisting of 5 statements about the benefits of exercise that the agent argued for, and 5 statements about exercise barriers that the agent argued against (see Fig. 5). A score from 1 (least important) to 10 (most important) was used to rank the importance of each statement in the decision-making process of doing regular exercise. The difference between the total scores of the items stating the benefits of exercise and the total scores of the items identifying exercise barriers was used to measure the participants' attitudes towards regular exercise. The ranking task was administered both before and after the interaction with the virtual exercise coach, and the change in scores was calculated to measure persuasion [23, 30].

A questionnaire consisting of the same ten statements about the benefits and barriers of regular exercise was used to measure participants' "decisional balance", representing one's relative weighing of the pros and cons of exercise [31, 32]. Participants were asked to rate each statement on a scale of 1 to 7, with 1 being "not at all important", and 7 being "extremely important". The decisional balance questionnaire was administered both before and after the interaction with the virtual exercise coach. Ratings from negative items were reverse coded, and an average score was calculated for this composite measure.

- + I would have more energy for my friends and family if I exercised regularly.
- I think I would be too tired to do my daily work after exercising.
- + I would feel less stressed if I exercised regularly.
- Exercise prevents me from spending time with my friends and family.
- + Exercising puts me in a better mood for the rest of the day.
- At the end of the day, I am too exhausted to exercise.
- + I would feel more comfortable with my body if I exercised regularly.
- Regular exercise would take too much of my time.
- + I would feel more confident if I exercised regularly.
- Exercise puts an extra burden on my life.

Figure 5. Ten statements about regular exercise. (Statements starting with a "+" are those that the agent argued for, and those starting with a "-" are those argued against.)

Immediately following their interaction with the agent, participants also completed a self-report questionnaire assessing their satisfaction with, and their attitudes towards, the agent, including several single-item, 7-point scale questions (see Table 1). Participants’ perception of the agent’s cultural background (manipulation check) was assessed by two single-item, 7-point scales (see Table 1, Q11-Q12). A standard questionnaire was used to evaluate the trustworthiness of the virtual agent [33].

C. Procedure

Participants were first given a baseline questionnaire asking about their demographic information. Their language proficiency, level of acculturation, and feelings of being a member of their ethnic group were also measured. Then participants were asked to complete the decisional balance questionnaire, and the ranking task measuring their attitudes towards regular exercise. Following a brief introduction to the virtual agent system, participants were asked to interact with the agent for approximately 20 minutes. The same decisional balance questionnaire and ranking task were then administered again, immediately following their interaction with the agent, as well as questionnaires measuring their satisfaction with, and attitudes towards, the agent. A semi-structured interview was conducted at the end of the study, focusing on participants’ overall impression of the experience and their perceptions of the cultural adaptation.

V. RESULTS

A. Manipulation Check

First we conducted between-subject non-parametric Wilcoxon rank-sum tests to confirm if our cultural adaptation manipulation worked (Table 1, Q11-Q12). When asked how much they felt the agent was part of American culture, participants in the American condition (mean=5.3) rated significantly higher than participants in the Chinese condition (mean=4.0), with  $p=0.01$ . Similarly, when asked how much they felt the agent was part of Chinese culture, participants in the Chinese condition (mean=4.6) rated significantly higher than participants in the American condition (mean=3.5), with  $p=0.007$ . To further examine participants’ perception of the agent’s cultural background in each condition, we carried out one-sample non-parametric tests (Wilcoxon) to determine whether the sample median was equal to neutral (=4). The results (see Table 2) showed that participants in the American condition correctly recognized that the agent was part of American culture (significantly higher than neutral,  $p=0.001$ ), and participants in the Chinese condition correctly recognized that the agent was part of Chinese culture ( $p=0.03$ ).

B. Persuasion

A Shapiro-Wilk normality test was performed, and the distribution of the participants’ persuasion score was found to be non-normal ( $p<0.001$ ). Therefore, we performed a non-parametric Wilcoxon rank-sum test, and found a trending effect of the study condition on the agent’s effectiveness of persuasion ( $p=0.1$ ). Participants reported higher attitudinal

change towards exercise in the American agent condition ( $N=24$ , mean=4.13), compared to participants in the Chinese agent condition ( $n=25$ , mean=1.40).

We also analyzed the decisional balance score before and after the interaction with the agent. A mixed-effects model was used, with the participants’ decisional balance score as a dependent measure, and study condition and pre/post test as predictors. The level of subjects was set to be a random effect. We found no significant effect of the study condition, but a significant increase of decisional balance score for both conditions ( $p<0.001$ ), indicating that participants had a more positive attitude towards exercise after the interaction.

We found no significant interaction between study condition and participants’ acculturation level on either persuasion or decisional balance.

C. Subjective Measures

In general, participants were satisfied with the agent, liked the agent, trusted the agent, and found the system easy to use. Table 3 shows the descriptive statistics for the outcome measures. We found a near significant effect of the study condition on participants’ feeling about how interesting the agent was. Participants in the Chinese condition felt the agent was more interesting (mean=4.7,  $sd=1.5$ ) than in the American condition (mean=4.1,  $sd=0.9$ ), with  $p=0.1$  (Wilcoxon rank-sum test). No other significant differences between study conditions were found.

TABLE I. SELF-REPORT SCALE MEASURES COMPLETED AFTER AGENT INTERACTION

Question	Anchor 1	Anchor 7
Q1. How socially close do you feel to the agent?	Not at all close	Very close
Q2. How satisfied are you with the agent?	Not at all	Very satisfied
Q3. How much would you like to continue working with the agent?	Not at all	Very much
Q4. How much do you like the agent?	Not at all	Very much
Q5. How easy was talking to the agent?	Easy	Difficult
Q6. How interesting was the agent?	Boring	Interesting
Q7. How would you characterize your relationship with the agent?	Complete stranger	Close friend
Q8. How much do you feel that the agent cares about you?	Not at all	Very much
Q9. How do you feel that you and the agent understand each other?	Not at all	Very much
Q10. How effective was the agent at motivating you to exercise?	Not at all	Very much
Q11. How much do you feel that the agent is a member of the American culture?	Not at all	Very much
Q12. How much do you feel that the agent is a member of the Chinese culture?	Not at all	Very much

TABLE II. MANIPULATION CHECK ONE SAMPLE TESTS RESULTS

	Measures	Mean (SD)	P-value
American Condition	Feel the agent is from American culture	5.3 (1.4)	0.001*
	Feel the agent is from Chinese culture	3.5 (1.4)	n.s.
Chinese Condition	Feel the agent is from Chinese culture	4.6 (1.3)	0.03*
	Feel the agent is from American culture	4.0 (1.7)	n.s.

TABLE III. RESULTS OF SUBJECTIVE MEASURES FOR ALL PARTICIPANTS

	Mean	SD
Satisfaction with agent	5.2	1.4
Like the agent	5.1	1.4
Easy to use	2.9	2.0
Agent is interesting	4.4	1.3
Feel agent cares about me	5.0	1.3
Effective at motivating me to exercise	5.4	1.3
Trust the agent	6.1	0.7

#### D. Qualitative Interviews

Overall, participants were satisfied with the experience, liked the agent, and found the dialogue easy to understand and the system easy to use.

*“It was great and I can easily understand what she said about exercise.”* (P3, Chinese)

*“It was pretty good. It’s quite convincing with the use of examples and scientific facts for the benefits of exercise. I’d like to do it again.”* (P15, American)

Participants perceived the American agent to be from the U.S. culture because of her conversational style (specific and straightforward), social chat topics, and the examples she provided of common exercises.

*“She talks about ‘specific’ information, which is more American style.”* (P24, American)

*“I think she is American because she mentioned the Red Sox and something about football in the conversation.”* (P31, American)

*“If she were a Chinese coach, she would suggest only indoor activities. However, she suggested outdoor ones like hiking. She also talked about how exercise can help your mental health. I don’t think a Chinese coach does that.”* (P36, American)

*“The pictures are all from Americans, and exercise is more of an American culture. The agent kind of encouraged directly, and she was straightforward.”* (P39, American)

Participants in the Chinese condition also noticed the culturally adapted features:

*“She talked about exercises and trends that are really popular in China.”* (P6, Chinese)

*“She showed all of the Chinese culture stuff, like the WeChat and badminton. I don’t think Americans play badminton that much.”* (P37, Chinese)

Some participants in the Chinese condition felt the agent was more like “a Chinese who grew up in America”, because the synthetic voice used in the study did not have markers of a Chinese accent, and because they felt a virtual agent promoting exercise was more American than Chinese as “Asians don’t care much about daily exercise”.

When asked whether they would exercise more if the agent were Chinese rather than American, participants provided mixed responses. Some expressed they would prefer a Chinese coach, as a Chinese coach would understand their language better. Some expressed that they

would exercise more with an American coach, because they felt Americans were more active and knowledgeable in the field of regular exercise. Others stated that as long as the agent provided useful information about exercise, the ethnicity or cultural background of the agent wouldn’t affect the amount of exercise they would do.

*“I would prefer a Chinese coach because my English isn’t good enough to understand specific words for exercise.”* (P20, American)

*“More with an American coach because in China, not too many people exercise in gyms, I mean more and more people are starting to but compared to Americans, Chinese don’t focus on exercise everyday.”* (P35, Chinese)

*“I like American exercise style, so if the agent is more American style, I will prefer her more.”* (P36, American)

*“I would exercise more if she is more of American style, because from my perspective, Americans are more active in exercise.”* (P46, Chinese)

*“It doesn’t matter. The information is more important. I don’t care who is giving it to me.”* (P16, Chinese)

Participants also provided useful recommendations to better tailor the Chinese adapted agent to the targeted Chinese population, including improvements to the agent’s appearance, clothing, synthetic voice, non-verbal behavior, and dialogue content, as well as other features for the background environment.

#### E. Discussion

Both virtual exercise coach agents were successful in persuading young Chinese adults to start regular exercise. We found participants correctly identified the Chinese adapted agent to be more Chinese than neutral, and the American to be more American than neutral. This proved that our cultural adaptations in both systems were successfully recognized.

We hypothesized that the Chinese agent would be more effective in persuading Chinese participants, but instead found a trending effect supporting the opposite. There are several explanations for this. First, since regular exercise, the topic discussed during the interaction, is not traditionally a popular theme in Chinese culture, young Chinese adults moving to the U.S. may perceive the American character as more knowledgeable, and more authoritative in the field of exercise coaching, and thus would be more willing to follow advice offered by the American figure. Qualitative analysis of the semi-structured interviews revealed that some participants indeed preferred the American agent, because they felt “Americans were more active in exercise”, and they “liked the American exercise style”. Second, there is still much to improve in our approach to cultural adaptation for the Chinese agent. Although we tried to include many elements from Chinese culture, these modifications may seem superficial to some Chinese participants. In spite of the fact that our participants in the Chinese condition were able to correctly identify the agent as part of Chinese culture, they

did not perceive the agent to be very “Chinese”, rating it only 4.6 on average on a scale of 1-7, while some stated that the Chinese agent felt more like “a Chinese who grew up in America”. Although participants found our Chinese agent interesting, they might not find the agent convincing enough to be authentically Chinese with shared cultural values, thus affecting the hypothesized effect of cultural adaptation on persuasion.

We did not find any interaction effect between the study condition and level of acculturation on persuasion; hence our second hypothesis was not supported.

## VI. CONCLUSION

We describe the development of two exercise coach conversational agents that promote physical activity among young Chinese adults, and their adaptation to American and Chinese cultures. To investigate the effect of cultural adaptation on persuasion, a between-subject study was conducted. Our findings suggest that, although the Chinese agent was found to be more interesting, the American agent was more effective in persuading study participants to exercise. In general, we found participants’ attitudes towards exercise increased after their interaction with the agents in both conditions. Overall, participants’ satisfaction with the agent, trust in the agent, and perceived ease of use were high across both conditions.

Cultural adaptation can be very complicated, and the effect of cultural adaptation might work differently when applied to different scenarios. In the case of promoting regular exercise among young Chinese adults living in the United States, we found that an agent adapted to American culture might be more effective.

Future directions of research include investigating additional means of cultural adaptation for embodied conversational agents tailored for Chinese culture, and testing the effects of cultural adaptation in other application areas beyond exercise promotion. We also intend to conduct a 2x2 experiment, including both Chinese and Caucasian participants, in order to further examine the tailoring effect of cultural adaptation on users from different target cultures. Finally, health behavior change interventions are necessarily longitudinal, and the temporal effects of acculturation and cultural adaptation should be investigated. Should a conversational agent gradually change its level of acculturation to match the user’s, or should it stay static throughout?

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