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Authors(English)	Shaoyu Ye, Akira Sakamoto, Akiyo Shoun, Mari Aita
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Japanese Students' Impressions Formed of Chinese Students through Cell Phone Communication: Comparing Text and Voice Messages

Shao-yu Ye, Akira Sakamoto, Akiyo Shoun and Mari Aita

Graduate School of Humanities and Sciences, Ochanomizu University, Japan
E-mail: ysy810@hotmail.com

INTRODUCTION

In Japan, cell phones are used not only to talk, but also to access the Internet, to send and receive e-mails, and to use the Short Message Service (SMS). They have rapidly become very popular over the last decade, and other media tools are not even comparable. It has been found that the characteristics of cell phone text messages are different from those of cell phone calls, and these differences have been found in various issues, such as in college students' attitudes toward their friends, and ways for maintaining friendships (Okamoto & Egawa, 2003; Okamoto & Takahashi, 2006; Furutani & Sakata, 2006), and the extent of interpersonal tension and the effectiveness and speed of information transmission (Tsuzuki & Kimura, 2000), and the structure of interpersonal relation networks (Kitamura, Jibiki, Akiyama, & Horita, 2006; Jibiki, Kitayama, Akiyama, & Horita, 2006).

As cell phone text messages lack paralinguistic and non-verbal cues, and are free from temporal and physical restrictions, they are seen as equivalent to conventional CMC (computer-mediated communication) such as e-mail and electronic bulletin boards (e.g., Miyata, 1993; Nakamura, 2001). It has been studies to understand whether or not CMC can make impressions of communication partners more consistent with

their social stereotypes. Epley and Kruger (2005) have shown that the impression that European-American students had about African-/Asian-American students was more stereotypical when they interacted via e-mail, than over the telephone. They argued that this was at least partly because European-American students formed impressions of their partners based on stereotypes when interacting via e-mail, since text-based messages had no paralinguistic or non-verbal cues, and therefore the content could be more ambiguous than voice messages.

In Japan, the number of non-native Japanese residents is increasing. At the end of July 2008, MEXT (Ministry of Education, Culture, Sports, Science and Technology) published a policy stating that Japan will aim to accept 300,000 international students (ISs) by 2020 (MEXT, 2008). This allows us to assume that intercultural communication between Japanese students (JSs) and International students (ISs) will be essential and unavoidable in daily campus life in the near future. At present, 95.6 percent of ISs possess a cell phone and 75.8 percent are using the cell phone text messaging service to communicate (Mizuta, Doi, & Yamamoto, 2004). Therefore, it will be important to examine the characteristics of intercultural communication using cell phones.

Therefore, in this study, we conducted an experiment to examine what kinds of communication medium would make the impression of ISs that JSs formed, more consistent with stereotypes of ISs when JSs had a conversation with ISs through cell phone text or voice messages. For this study, Chinese students (CSs) were selected as ISs, because over 60 percent of ISs in Japan are Chinese (MEXT, 2008). Note that all participants in Epley and Kruger (2005) were native English speakers, and their responses in voice condition were transcribed, and used as responses in the e-mail condition. In our study, however, we used actual CSs in both voice and text conditions, to examine what would happen when CSs used cell phones in real Japanese-Chinese intercultural communication.

The effect of conversation topics was also examined in this study. As mentioned earlier, stereotypes were expected to have a stronger influence on impressions formed based on text messages, than impressions formed based on voice messages. Furthermore, we predicted that this effect would be greater on international topics, than on daily life topics. While daily life topics may be private, and expressed in various ways, international topics deal with group-level information, and may be expressed in comprehensive images (Harasty, 1997). JSs would therefore be more aware of their targets being "Chinese", and be more easily reminded of their stereotypes, when they communicate about international topics, compared to daily life topics. If a text message-based impression is more reliant of stereotypes than a voice-based impression, the effect of international topics would be reduced when communicated through voice messages due to the smaller stereotype influence. For this reason, we also focused on the interaction effect for topics and communication mediums.

In addition, we also examined what could explain the effect of communication mediums on JSs' impressions of CSs. In the earlier-mentioned Epley and Kruger's study, European-American students remembered more about what African-/Asian-American students responded in an e-mail-rather than over the phone. This amount of recall was, however, not related to their final impression of their targets. The authors then argued, that the difference in impression between two communication mediums could partly be attributed to the contextual ambiguity which was greater in an e-mail than in telephone conversations. Therefore, in the present study, we also measured the amount of JSs' overall recall, and the ambiguity of CSs' responses in text and voice messages.

Besides these variables, we measured three other mediators, which were not measured in Epley and Kruger's study. The first was the amount of responses by CSs. Given the fact, that typing text messages requires more effort than to speak, CSs would have fewer responses in text messages than in voice messages. It can therefore be predicted that in text messages, JSs would have to make greater use of stereotypes to fill in the gaps, and thus would form more stereotypical impressions.

The second was the stereotypicality of the content recalled by JSs. Since there are fewer paralinguistic cues in the text messages than in voice messages, it is likely that JSs in the text condition would interpret CSs' responses in line with the stereotypes than those in the voice condition. In this case, JSs in the text condition will better remember the CSs' responses, which are likely to correlate with stereotypes, and will retrieve them more easily to form impressions of CSs.

The third was the stereotypicality of CSs' actual responses. Compared to face-to-face communication, people conform less when making their own judgment in CMC (Smilowitz, Compton, & Flint, 1988). In other words, there is less social pressure to conform to the majority in CMC. Therefore, CSs in the text condition may not go along with JSs, but behave in a way which is more consistent with stereotypes of CSs, than in the voice condition.

Therefore, we measured five mediators. Three of which were (A) amount, (B) ambiguity, and (C) stereotypicality of the CSs' actual responses. The other two were (D) amount, and (E) stereotypicality of the JSs' recalled content. For variables (a), (b), (d), and (e), if they indicate the effects of differences between the two mediums, this means that the stereotypes of CSs should influence JSs' impression formation. On the other hand, if variable (c) indicates the effects of differences, it means that JSs' impression formation is not influenced by stereotypes.

To investigate there issues, we instructed JSs to use cell phones to: (i) ask questions of CSs; (ii) freely describe the impression of their partner after reading or hearing CSs' answers; (iii) recall their partner's responses to each question; and finally (iv) evaluate the partner by rating him or her on the stereotype items scale.

We used both stereotypical expressions in the free description section, and the stereotype scores obtained from the scale rating as dependent variables. Although Epley and Kruger (2005) did not use the free description measurement, we added this measurement to make the result more convincing.

In order to examine the relationship between the mediators and the effects of mediums, we analyzed the content of CSs' responses and JSs' recall of them. First, we counted the amount of CSs' responses. Then, in order to demonstrate if CSs' responses were more ambiguous in the text messages, or in voice messages, we conducted message analysis with regard to the ambiguity of responses. We then conducted message analysis to determine the extent to which the CSs' responses consisted of stereotypical elements. Third, we analyzed if the amount of JSs' recall of CSs' responses would be different between text and voice messages. Finally, we analyzed how many stereotypical elements would remain in JSs' recall of CSs' responses.

Based on the discussions mentioned earlier, the first purpose of this study was to examine the differences between text and voice messages in how JSs formed impressions of CSs. The second purpose was to clarify whether or not there was interaction about the topics and communication mediums in terms of stereotypes provocation. The two hypotheses examined in this study are as follows:

H1: When JSs form impressions of CSs through cell phone communication, the impression will be more stereotypical in text messages than in voice messages.

H2: The predicted difference between text and voice messages described in H1 will be stronger, when international topics are used for communication, than when daily life topics are used.

Besides these hypotheses, we also examined how the mediators could explain the effect of communication mediums on impression formation. This was the third purpose of this study.

METHOD

Preliminary Survey for Selecting Stereotype Elements

We had to measure how consistent CSs' responses, JSs' recall of CSs' responses, and JSs' impression of CSs were with the JSs' stereotypes of CSs. However, there were generally no accepted opinions regarding stereotypes that general JSs might already hold of Chinese ISs in Japan. Therefore, in order to select "stereotype" items to be used in the present study, we conducted a survey to determine what kind of items JSs perceived as stereotypical.

The participants of the survey were 342 students from four universities: Ochanomizu University, Tokyo Woman's Christian University, Tokyo Gakugei University, and the University of Tokyo. The procedure consisted, first of all, of surveying the stereotypes that Japanese people had about 12 countries

(Haratani, Matsuyama, & Minami, 1960) as well as for Asian ISs (Suga & Karasawa, 2006), and then selecting stereotypes of the highest score that apply to Chinese ISs. In addition, the stereotypes mentioned most often as a result of searching for the keywords "Japan, Chinese international students, stereotypes" on Yahoo and Google (the Japanese version) during the week of October 9-16, 2008 were selected. As a result, 41 items were developed for the preliminary survey. We made a 7-point scale (from 7 for "strongly agree" to 4 for "neither agree nor disagree" and to 1 for "strongly disagree"). The questionnaire containing these items was distributed during classes where students completed it. The questionnaire was collected onsite. The statistical results of the questionnaire was provided by the lecturers of the students, as a part of a class on a later day.

For the preliminary survey, we analyzed the answers obtained from 288 students, excluding responses with missing information and those from ISs. The mean score range for the 41 items was 3.50-5.30. We used the 12 items with the highest scores (a mean score of 4.50 or above) in the present experiment (See Table 1 for details).

Table 1: Stereotypical Items

Order	*Average Score*	*Content*
1	5.30	They are serious in the class.
2	5.27	They are diligent.
3	5.21	They are self-assertive.
4	5.13	Their kinship ties are strong.
5	5.05	They are trowing of their family.
6	4.81	They are competitive.
7	4.79	They are good at English.
8	4.77	They are positive in work.
9	4.72	They are ambitious.
10	4.69	They are smart.
11	4.64	They are passionate.
12	4.50	They are eloquent.

Experiment

A total of 80 students (50 females), 40 JSs (undergraduate and graduate students) and 40 CSs (undergraduate, exchange, graduate, and research students), participated in the experiment. They were from Ochanomizu University and the University of Tokyo. The experiment was a 2 (medium: voice vs. text) × 2 (topic: international vs. daily life) factorial design, both being between-subject factors. A JS and a CS of the same gender were paired.

Experimental Conditions: The experiment was conducted in an interview format. Each participant was randomly assigned to one of the experimental groups. In the

interview, a JS was the interviewer and a CS was the interviewee. The interview consisted of two topics: an international topic and a daily life topic (Table 2).

Table 2: Two Types of Topics

International Topics	*Daily Life Topics*
1. How long have you been in Japan?	1. What's your major?
2. Why did you come to Japan to study?	2. Why did you come to this university?
3. What do you think of your life in Japan?	3. How do you feel about your student life?
4. Do you often call your family in China, or send them e-mails?	4. Do you often participate extracurricular activities and the circle with your friends of the university?
5. What do you think of the university system of Japan? Are there any differences with the universities in China?	5. Do you always make phone calls, or send presents on your family's birthday or Mother's day, etc.?
6. What kind of advantages/ disadvantages do you think that Japan, or Japanese has?	6. What kind of job would you want to do not the future?
7. What do you think of mutual understanding between Japanese and Chinese?	7. If you could ask a genie to grant you any wish, what would you wish for?

Procedure

The experiment was conducted in pairs of JSs and CSs. Each student was led to different private cubicles, and it was explained to them that the purpose of the experiment was "studying how we form impressions towards other people using different communication mediums." The JSs were instructed to "interact with a Chinese international student in the other room, and rate your impression of him/ her." The CSs were instructed to "interact with a Japanese student in the other room and answer his/her questions." Before the experiment began, we used a questionnaire to find out the gender, age, birthplace, and major of the JSs, in addition to their average usage frequency of daily text messages (with a rating of 1 for "less than 5 times" to 7 for "more than 50 times"), of phone calls (1 for "one call every several days" to 7 for "more than 10 calls a day"), and of accessing the Internet using a cell phone (1 for "don't access at all" to 7 for "more than 2 hours"), respectively. We also asked the number of Chinese friends they had (1 for "none" to 7 for "more than 25"), their likableness (1 for "don't like at all" to 7 for "like very much") and their scores for the stereotype items towards general Chinese ISs (1 for "strongly disagree" to 7 for "strongly agree"). We used another questionnaire to find out gender, age, birthplace, and major of the CSs, in addition to their history of studying Japanese,

history of stay in Japan, Japanese Language Proficiency Test qualifications (the scores from test level 1 or 2, and date taken), and fluency in Japanese, as well as the amount of interactions with JSs (a. for "talk while standing," b. for "have dinner together," c. for "phone calls," and d. for "meet outside the campus"; with each option rated on a 1 for "less than 5 times" to 7 for "more than 100 times" scale) and their likableness towards general JSs (1 for "don't like at all" to 7 for "like very much").

Then, the interview began. In the voice condition, the JSs were instructed to ask a question, wait for a complete response, and then continue to the next question. In the text condition, the JSs were instructed to type each question, send it as a text message, and wait until a response came from their partner, and then continue to the next question. The CSs were instructed to answer their partner's questions, and not to ask any questions, unless they could not understand the meaning in the voice condition. Additionally, for the text message condition, before the interview began, both the JSs and CSs were asked to have a 5-minute input practice, to make sure there were no difficulties in sending or receiving messages, and that the students were accustomed to inputting messages.

The JSs received the following instructions regarding the interview: "Imagine you are interviewing someone you have never met before, and ask the questions. During the interview, you do not need to state your name or school. Your questions should be based on this list, so please do not ask any questions regarding your partner's responses. Please do not take notes on their responses." Then, the instructor left the room and waited outside. For the voice condition, the conversation between the JSs and CSs was recorded. For the text condition, as more time was needed than the voice condition, the students were checked every 15 minutes to see how far the exchange progressed, whether or not there was any difficulty in sending or receiving messages, and how many questions had been asked.

After all questions on the list had been asked, the cell phones were collected. Then, the JSs were asked to write a description of their concrete impressions about the interviewee. The CSs were thanked and told that the experiment had ended. Then, the JSs received a recall test that asked them to recall the target's responses to each interview question by free writing. Finally, they were asked to rate the target's impressions on the 7-point scale of the stereotype items shown in Table 1 (1 for "strongly disagree" to 7 for "strongly agree") and their likableness toward their partner on the 7-point scale (1 for "don't like at all" to 7 for "like very much"). After all the procedures were completed, the JSs were thanked, and the experiment was finished.

RESULTS

Standards of Analyzed Participants

In order to ensure that the CSs were able to sufficiently communicate with the JSs in each condition, we set the following standards stating that the CSs must:

(a) have over Level 2 JLPT (Japanese language proficiency test), (b) if not JLPT qualified, then have more than a 2-year history of studying Japanese, or staying in Japan before participating in the present experiment, or (c) have more than a 2-year total history of Japanese learning, and of staying in Japan for those who could not meet the first two standards stated earlier.

As a result, data from 5 CSs was disqualified from the analysis. We analyzed the data of the remaining 35 CSs and their partners (70 in total) are described as follows:

Validity of Participant Assignment

In order to confirm the homogeneity of participants assigned to conditions, we conducted a 2 (medium: voice vs. text) × 2 (topic: general vs. daily life) × 2 (gender: male vs. female) analysis of variance (ANOVA) using the CSs' JLPT scores, their history of Japanese learning, their history of staying in Japan, their amount of contact with JSs up to that point, and their likableness toward general JSs, as dependent variables. The analysis revealed no main effects, or interactions for each independent variable, except for the main effect for gender in the CSs' JLPT scores (female scores were higher, $p<.05$). In addition, we conducted the ANOVA of the same three factors model, using the number of CSs friends that JSs had, their likableness and pre-test stereotypes towards general CSs, as dependent variables. As a result, neither main effects, nor interactions for each independent variable were found, but there were main effects, of gender in the number of CSs friends (male JSs had more friends) and pre-test stereotypes (female JS had higher scores). These results supported appropriateness of the random assignment.

Investigating Hypotheses 1 and 2

Results based on scale rating. We predicted that cell phone text messages would lead to more stereotypical impressions, compared to cell phone voice messages. To verify this, we carried out a 2 (medium: voice vs. text) × 2 (topic: international vs. daily life) × 2 (gender: male vs. female) ANOVA, using as dependent variables, the stereotype scale scores by which the Japanese participants rated their partners, with whom they interacted. We obtained the scores by summing up the scores of 12 stereotype items, and Cronbach's alpha value of the 12 scores was .81. The ANOVA revealed that the significant main effect for medium ($F(1, 27)=4.24$, $p<.05$). The scores in the text condition were higher than those in the voice condition (Figure 1).

Results based on free description. Two female coders blind to our hypotheses, rated how many stereotypical expressions were used in the Japanese participants' descriptions. In fact, there were not only stereotypical responses, but also anti- stereotypical and neutral responses. For this reason, the free description was evaluated using the same 12 items as in the scale-based measurement, and rated on the 7-point scale (1 for "opposite," 4 for "can't say either," and 7 for "applicable").

The two coders selected scores from 1 to 7, to indicate whether or not each unitized description correlated with the 12 items. The stereotype scores obtained from the JSs were calculated according to the following three steps: (1) counting one coder's rating based on the 12 items for each description, (2) summing up the rating scores of Step 1, and (3) computing the average score between the two coders from the scores of Step 2. The correlation between the two coders' rating was extremely high (r = .99, p<.01)

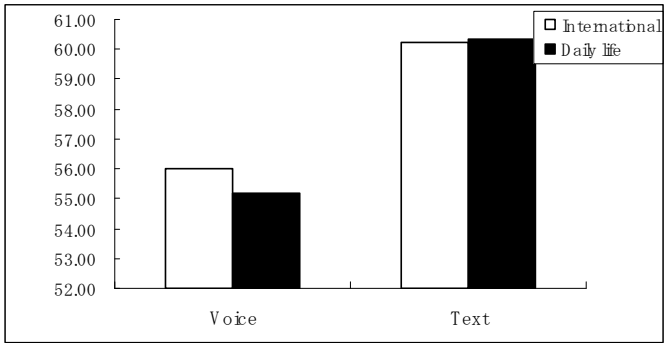

Fig. 1: JSs' Impressions of CSs

We then believed that we needed to change the "1-7" scale to a "-3~+3" scale due to the stereotypicality of JSs' free description and their recall. More specifically, we analyzed the results using a "-3, -2, -1, 0, 1, 2, 3" scale, containing a value to represent a neutral response, rather than the original rating of "1, 2, 3, 4, 5, 6, 7." This neutralization was implemented, because the JSs were not able to recall all their partners' responses to each question, and the score of stereotypicality could as a consequence be influenced in an inappropriate way, by the amount of recalled responses. Without the neutralization, when a response is recalled, it always enhances the stereotypicality score of JSs' recall, if it is anti-stereotypical.

We calculated the scores of JSs' free description mentioned earlier as a dependent variable, and submitted to a 2 (medium: voice vs. text) × 2 (topic: international vs. daily life) × 2 (gender: male vs. female) ANOVA. This analysis yielded neither a main effect, nor an interaction effect for any independent variables, for the medium, $F(1, 27)$ =.43, p=.52, *ns*.

To summarize the results, Hypothesis 1 was fully supported by the rating scale-based examination, but not by the free description-based examination. As no interactions were found for the topic and medium, Hypothesis 2 was not supported.

Mediation

As Hypothesis 1 was fully supported by rating scale-based examination, we conducted a follow-up analysis, to clarify how much the mediators could explain

the effects of the medium on JSs' impressions of CSs. There were five mediators, that is, the amount, ambiguity, and stereotypicality of CSs' responses and the amount and stereotypicality of JSs' recall.

The contents sent by the CSs. First, in order to demonstrate the amount of responses sent by the CSs, we counted the number of their utterances. When counting, we followed the way used by Kasagi and Daibo (2003), and made a transcript of all the conversations for both groups, and then all written characters were converted into *Hiragana,* excluding fillers such as *un*, *hai*, and *etto* in the voice condition, and also emotion signs in the text condition. We then used the word count function of Microsoft Word of Microsoft Office 2007. Using the amount of words in responses as a covariate, we conducted analysis of covariance (ANCOVA), with the scores of impression stereo-typicality as a dependent variable and the medium, topic, gender as independent variables. As a result, like in the case of the ANOVA, the main effect of medium was significant (F (1, 27)=7.29, p<.05), but the main effects of any other independent variables or interaction effects of any independent variables were not detected. The effect of the covariate was marginally significant (F(1, 27)=3.55, p<.10).

Next, in order to clarify whether or not the CSs' responses would be interpreted as being ambiguous depending on the mediums, another pair of female coders rated the ambiguity of each of 35 CSs' responses provided in either text or voice messages, as they were. The scale was modeled according to Epley & Kruger (2005). In the present study, we defined "ambiguous" as "the extent to which communication can be interpreted in multiple ways," with 11-point scales rating available (0 for "not at all ambiguous," 5 for "can't say either way," and 10 for "extremely ambiguous"). When rating, each coder rated every response from one CS, then we summed up the total rating score of responses for the seven interview questions. Because there were two coders, we used their average scores as the ambiguity scores for the CSs' responses. The correlation between the two coders' rating scores was extremely high (r = .98). Using the average score as a covariate, we conducted the same ANCOVA as mentioned earlier. As a result, the main effects of medium were again significant (F(1,27) = 4.64, p < .05). The main effects of other independent variables, or any interaction effects were not significant, and the effect of covariate was not significant, either.

Furthermore, the two coders, who rated stereotypical expressions in the JSs' free description, also rated the extent to which the CSs' responses contained stereotypical elements using the 7-point scales rating (1 for "opposite," 4 for "can't say either way," and 7 for "applicable"), with regard to each of the 12 stereotype items for each answer to the seven interview questions. The score range of stereotypicality of CSs' responses was changed to "-3~+3" as mentioned earlier, and the score of each answer was calculated as a total score from the 12 items. As there were seven answers, one coder's total rating score of the 7 answers was computed, and we used the average scores of the two coders, as the student's score of stereotypical responses. The correlation coefficient between the two coders' scores was high (r=.88). Using the average score as

a covariate, we conducted the ANCOVA. As a result, unlike the ANOVA, the main effect of the medium became marginal ($F(1,27) = 3.07$, $p < .10$). The effects of other independent variables and the covariate, or any interaction effects were not found.

JSs' recall. We analyzed the JSs' recall in the text and voice messages. Since one of the JSs took notes of his partner's responses, his recall data was excluded from the analysis. Three coders (two males and one female), unaware of our hypotheses, then evaluated the remaining 34 students' recall, using a scale from 0 to 2 (0 for "no recall," 1 for "partly recall," and 2 "perfect recall") referring to the transcript conversations, including the order of CSs' responses, and the content. Each JS's recall was scored through the process of: (a) one coder's rating score of the participant in all seven questions; and (b) averaging scores of the three coders. The correlation between the three coders' scores was high (rs=.90 ~ .94). The results of the ANCOVA with the average score as a covariate, yielded a significant main effect of the medium ($F(1,27)=3.95$, $p<.05$). The effects of other independent variables and the covariate, or any interaction effects were not significant.

Next, the two coders who rated the stereotypicality of CSs' responses also rated the extent to which the JSs' recall contained stereotypical descriptions, using a 7-point rating scale (1 for "opposite," through 4 "can't say either way," to 7 "applicable") for each of the 12 stereotype items, with regard to the seven questions. We calculated the average of the two coders' rating scores to find each student's stereotypicality score for each question, and then changed the rating range to the "-3~+3" scale, as described earlier. We finally summed up the student's scores for the seven questions (The correlation between the two coders' total scores of seven questions was .99). The result of the ANCOVA with the summed score as a covariate, revealed a significant main effect of the medium ($F(1, 27)=4.48$, $p<.05$), while the effects of other independent variables and covariate, or any interaction effects were not significant.

As already described, only when the stereotypicality of CSs' responses was a covariate, the main effects of the medium were weakened. This implies that this mediator, not any of the other mediators, was partly responsible for the effects of the medium.

DISCUSSION

There were three purposes of this study. The first was to examine how much differences there were in the JSs' impression formation of CSs, between the use of cell phone text messages, and cell phone voice messages. As a result, Hypothesis 1 was fully supported by the rating scale-based examination, but was not supported by the free description-based examination. Unlike Epley & Kruger (2005), we had the JSs interact with actual persons in both text and voice conditions, yet the results of the rating scale-based examination, were consistent with the study by Epley & Kruger (2005). This confirms the validity and robustness of their study results. Note that they did not carry out the free description-based examination.

One of the reasons for the discrepancy between the results of the two examinations, could be explained as follows. In terms of free description, what the JSs wrote was the most impressive for them, but did not necessarily correlated with the stereotypes of CSs. For instance, many JSs mentioned that their partners used signs showing emotions, and this was related to the impressions of the CSs. Also, many JSs wrote that their partners seemed to be "generous, polite, and sincere, and may show Chinese accent when speaking in Japanese." These expressions were rated as uncorrelated with the 12 stereotype items in this study. Actually, the 35 JSs made 181 unitized descriptions in total for their impressions of CSs, and we obtained 2172 scores, because these descriptions were rated using the 12 items scale, whose points could be from -3 to 3. Out of the 2172 scores, 1977 scores (91.02 percent) were given the point "0," which implied no correlation with the stereotypes of CSs. In addition, since the score of each description was computed by summing up the 12 item scores, the possible points were from -36 to 36, and we obtained 181 scores. Out of the 181 scores, 74 scores (40.88 percent) were 0, the scores of 75.14 percent ranged from -3 to 3, and the scores of 95.58 percent ranged from -6 to 6. The maximum and minimum vales were 12 and -9, respectively. Thus, the distribution of scores was limited, and it seems this "range restriction" might make it difficult to detect the main effects of the medium (Hays, 1994). Although this explanation would make the results of rating scale-based examination more important, and the influences of medium more believable, future research is necessary to obtain further confidence.

The second purpose of this study was to demonstrate whether the differences of the impressions between text and voice messages, would become large or not, due to the two different types of topics, as indicated in Hypothesis 2. We predicted that the differences in impressions between text and voice messages would be smaller for daily life topics, than for international topics, because the former topics would not evoke stereotypes of CSs, which JSs could use in their impression formation, unlike the latter topics. However, topics were not found to have any effects on the JSs' final impression. This might be because the experiment was conducted in Japanese, and CSs' pronunciation of Japanese, intonation, accent, use of polite language, delivery speed, and so forth may have made the JSs become aware that the CSs belonged to an out-group. This may have reminded the JSs of CSs' stereotypes, even though daily life topics were used. Another possible reason might be the fact that the stereotypes of CSs were little used in the JSs' impression formation.

The third purpose of the present study was to examine which mediators could explain the effects of the mediums on the JSs' impression of CSs. The results from the rating scale-based data, suggested that it could not be explained by the amount and ambiguity of CSs' responses, or the amount and stereotypicalitly of JSs' recall. It could be, however, be partly a result from the stereotypicality of CSs' responses. Although Epley and Kruger (2005) argued that the differences in impression between mediums were due to stereotypes influencing, impression formation in different ways, the result

of the present study was not consistent with this argument, and did not support the existence of stereotypes influence. Instead, the result of the present study supported the possibility that the differences in impression were generated because CSs changed the stereotypicality of their responses, depending on mediums.

The results of the present study and that by Epley and Kruger (2005) were different, and some of the reasons for it are plausible. For example, the participants in this study did not actually use as many stereotypes in impression formation, as the participants in the study by Epley and Kruger (2005). In addition, although the text and voice messages were identical in Epley and Kruger's study, they were different in the present study. This is because JSs interacted with a real person, regardless of whether the participants communicated through text or voice messages in this study. Therefore, it may be that a variety of variables influenced the JSs' impression formation, the influence of stereotypes was not strong enough to overcome the influence of those variables, and consequently, the result did not identify the influence of stereotypes. In any case, future examination is necessary.

As described earlier, the use of different mediums resulted in the generation of different types of impression, and this may be attributed to the differences in stereotypicality of the CSs' responses instead of the stereotypes of CSs. There is, however, an alternative explanation. Some of the 12 stereotypes of CSs that were selected for this study, included intelligence-related items. When JSs and CSs communicated, JSs may not perceive CSs as being intelligent because, for CSs, Japanese is not a native language, and therefore, their Japanese may be accented, or does not appear natural. This may be more significant in voice messages than in text messages, as there is an additional issue such as unnatural pronunciation. This may explain why the voice messages less often corresponded with the stereotypes, than text messages. However, note this is a complicated issue, because CSs tend to make more Japanese grammatical mistakes in text messages, than in voice messages (Ye, Shoun, Aita, & Sakamoto, 2009). To prove this point, we divided the 12 stereotypes into a group of items related to intelligence (serious in class and in research, diligent, competitive, good at English, smart, and eloquent), and a group of items not related to intelligence (self-assertive, have strong kinship ties, considerate of their family, positive in work, ambitious, and passionate), and conducted ANOVA, using the total scores for each group as a dependent variable and the medium, topic, and gender as independent variables. The result showed that, when the scores of intelligence-related items were regarded as dependent variables, the main effect of medium was not significant. In the case of the items that were not related to intelligence, however, the main effect of the medium was significant ($F(1, 27)=5.56$, $p<.05$). Therefore, the medium had effects on the items not related to intelligence, suggesting that the intelligence-related alternative explanation described earlier does not seem plausible.

CONCLUSION

As already described, this study has indicated that: (a) the JSs' impression formation of CSs were more consistent with stereotypes of general CSs when they used text, than when speaking on the phone; and (b) this may be partly due to differences in the responses made by CSs instead of JSs' relying on stereotypes of CSs when forming impressions of them. Some parts of the study results require more clarifications; therefore, future studies are necessary to make the conclusions more assertive. Still, however, this study suggests that, while confirming the robustness of the findings of Epley & Kruger (2005), an impression varies with the mode of cell phone use. Considering cell phone-based intercultural communication will continue, we believe our study has provided a meaningful study theme for the future.

It is necessary to note the generality of the findings in the present study. All the participants in the present study were specialized, as they were from Ochanomizu University and the University of Tokyo, and the analyzed participants were restricted to those with a middle or senior level of Japanese language competency. The present study did not provide any findings for JSs' intercultural communication with the students, coming from other countries other than China. Research for generalizing the findings of this study will also be a meaningful orientation in the future.

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