

Construction of a Japanese Language Learning Support System for Learning Semantic Negotiation

Satoru Kogure^{a*}, Akira YOSHIDA^b, Yashihiro NOGUCHI^a, Koichi YAMASHITA^c,
Tatsuhiko KONISHI^a & Makoto KONDO^a

^a*Faculty of Informatics, Shizuoka University, Japan*

^b*Graduate School of Integrated Science and Technology, Shizuoka University, Japan*

^c*Faculty of Business Administration, Tokoha University, Japan*

*kogure@inf.shizuoka.ac.jp

Abstract: Semantic negotiation techniques are important for beginners of Japanese learner. In this study, we investigated how semantic negotiation is handled in a learning environment and then reclassified it. We developed a Japanese language learning support system that can handle semantic negotiation using text input. We report the results of a questionnaire survey administered to three Japanese language teachers and an experimental evaluation of a foreign student.

Keywords: Semantic negotiation, Japanese language learning, role-play, cooperative learner agent

1. Introduction

The process of interaction between participants in a conversation, such as clarification requests and confirmation checks, to understand the intentions of the other party, is called semantic negotiation (*SN*) (Varonis, & Gass, 1985; Long, 1996). *SN* is important for second language (*L2*) learners, who are likely to experience frequent communication problems in the language they are learning. However, Miyazaki pointed out that in Japan, "research results on *SN* are not reflected in Japanese language education" (Miyazaki, 2020). In fact, our survey of instructional materials used in Japanese language education (Three A Network, 2016) revealed that most students did not use *SN*. We also administered a questionnaire survey to Japanese language teachers. We found that three out of the four teachers did not teach *SN* in their classes because it was not a part of the curriculum. Thus, *SN* is not considered important in the field of Japanese language education. To solve these problems, we constructed an environment that enables self-taught learners to study *SN* in Japanese. The objectives of this research are (1) to propose a learning scenario that enables beginner learners of Japanese to learn *SN* as a means of adjusting to problems that occur in dialogue, and (2) to construct a text-based Japanese dialogue system that helps students to learn dialogue and *SN* in Japanese through conversation-based experiences with a cooperative learner agent (*CLA*).

2. Semantic Negotiation

The classification of *SN* in Japan has not been well established (Yokobayashi, 1991; Fujinaka, 1996; Igari, 1998). In this study, we newly categorized and defined *SN* with reference to previous studies that deal with the classification of *SN*. The categories of *SN* defined in this study can be divided into those conducted by the learner and those conducted by partner. *SNs* for learner include (A) reduction strategy and (B) achievement strategy. (B) strategy can be divided into (B1) speech strategy and (B2) listening strategy. In this study,

we focused on (B1) speech strategies and classified them in detail. (B1) speech strategies can be divided into (a) direct appeal, (b) indirect appeal, (c) non-linguistic, (d) implicit signal of uncertainty, (e) confirmation of partner's understanding, (f) code switching, (g) literal translation, (h) paraphrase, (i) substitution, (j) generalization, (k) neologism and (l) restructuring. SNs for partner include (i) error corrections, (ii) contributors/completions, (iii) elaborations, (iv) confirmation checks and (v) clarification requests. Among the negotiation of meaning conducted by the learner, (A) the "reduction strategy" is not dealt with because it is difficult for the system to recognize it. In this study, we primarily addressed (B) "achievement strategies". Among (B) "accomplishment strategies," (B2) the "listening strategy" is limited to cases in which the system is not sure of the meaning of the other party's utterance and the user wants to confirm whether his/her understanding is appropriate, according to the specification of the system for text-based dialogues. Therefore, (B2) "listening-back strategy" is a SN, in which the learner responds to the other party's utterance with a question, and the other party responds to the SN by answering the question. For (B1) "speech strategies," this study covers SN (a), (e), (f), (g), (h), (i), (j), (k), and (l). We did not use SN (b), (c), and (d) because they cannot be realized in a text-based learning support system.

To investigate how much SN is actually taught in the field of education, we administered a questionnaire survey to four teachers who teach Japanese at Shizuoka University. In terms of learning materials, one respondent used "dialogue including SN without explicitly stating it" while another respondent used "dialogue including SN with explicitly stating it" as a learning material, and two respondents did not use "dialogue including SN." This indicates that SN is not always taught in Japanese language study. In the classes that used "dialogue including SN without explicitly stating it," only (i) error corrections and (iv) confirmation checks were used, and the learners' (B1) "speech strategies" were not covered. On the other hand, the lessons that involved "dialogue that includes SN" as the learning material dealt with (A) reduction strategies, (B1) speech strategies, and (B2) strategies for listening back (i) "corrections," (ii) "contributions and completions," (iv) confirmation checks, and (v) clarification requests. When focusing on the "speech strategies," only one of the four respondents used the material including these strategies in their classes. Two respondents who do not employ SN stated that they do not teach it because it is not part of the curriculum. This indicates that SN, or speech strategies, are not taught in Japanese language learning.

3. Composition of a Japanese Language Learning Support System Targeting Semantic Negotiation

In this study, we constructed a text-based dialogue system that supports SN and allows for free input. The system is implemented in three parts: (1) scenario selection, in which the learner chooses a scenario to be learned with reference to learning goals, learning content, and dialogue situations; (2) a dialogue portion, in which the learner interacts with the agent according to the situation provided; and (3) feedback, in which the system evaluates the learner's dialogue from the teacher's perspective. In this system, in order to "set up a lesson specialized for the learning of a certain SN," expressions that trigger the detection of the use of that negotiation are registered in advance in the contents prepared by the teacher. The number of SN that a learner can learn acquire simultaneously is limited to one; hence, there is no error in the detection of SN. The teacher needs to prepare two pieces of content in advance for each lesson: "situation contents" and "SN contents". "Situation content" includes the image file name of the situation, the caption, the learner's assumed utterances and the CLA's utterances, as well as the results of the dependency parsing of the learner's utterances. SN content includes the type of SN to be studied, the words and phrases that trigger the negotiation, the learner's sentences assumed used in the negotiation, and the results of the analysis of the engagement of these sentences.

4. Experimental Evaluation

To evaluate the usability of the system, we asked three Japanese language teachers who teach Japanese to foreign students and one foreign student who is studying Japanese to use the system. In an experiment with three teachers, we first (1) explained SN to the teachers, (2) asked them to view slides and videos on how to use the system, and (3) asked them to view slides and videos on how to create content for this system. From the results of the questionnaire, we obtained a rating (3.00 out of 5) that the system is somewhat effective in helping students learn SN. On the other hand, we received 2.67 and 2.33 in the "would you want your students to use it" and "would you use it in class" categories, respectively. These results indicate that there is room for improvement of the system. In the experiment with one international student, we administered (1) a pre-questionnaire, (2) an explanation of SN and system usage, (3) a tutorial on system usage, (4) the first learning session of SN, (5) the second learning session of SN, and (6) a post-questionnaire. This foreign student had not learned SN explicitly in class, but was already familiar with SN itself. We received a score of 4 and a score of 5 (on a 5-point scale) in the evaluation of whether the system was useful for learning SN and whether we would like to use the system in the future, respectively.

5. Conclusion

We developed a Japanese language learning support system that enables self-study of SN, based on the fact that SN techniques are very important for beginners in Japanese, but have not been adopted in the broader field of Japanese language education. The results of the questionnaire survey of two Japanese language teachers suggested that the system itself is effective, but when asked if they would want to use it in their classes, they gave it a score of three or less out of five. In the future, it will be necessary to conduct experimental evaluations with a larger number of Japanese language learners and to develop an authoring tool that enables teachers who are not familiar with IT systems to create content.

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