Processing Pragmatics for Computer-Assisted Language Instruction

Keiko Horiguchi
Computational Linguistics Program and Center for Machine Translation
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213
keiko@cs.cmu.edu

Computer-assisted language instruction systems that only perform syntactic processing of input sentences are not able to offer advice on pragmatic aspects of language use, and they cannot handle the variability generally afforded by natural languages to express a given propositional content.

This paper describes a solution to this problem implemented as an extension to the existing Japanese tutorial system ALICE-chan (Evans & Levin 1993). We designed the p-structure to represent pragmatic information as well as the propositional content of a sentence. The pragmatic content is encoded in terms of the speech situation, the speaker's attitude toward the addressee, and the felicity conditions for the intended speech act. Linguistic features that express the speaker's uncertainty are interpreted as reducing factors that weaken felicity conditions of the intended speech act of the sentence.

We implemented a p-structure mapping program that generates p-structures from syntactic structures. As an example, the p-structure for the sentence Tegami-wo kaite itadakenai darou ka to omou n desu ga ("I wonder if you might be able to write a letter for me") is shown below.

SPEECH-ACT: requesting-action
FEATURE: receive-favor-potential
ACTION: ACTEE
書いて (kaitte) 
SENSE: "write"

BELIEF: EXPECTATION
FEATURE: REDUCING-FACTOR
EXTENDED-PREDICATE: PREDICATE
CONJUNCTION: THINK
NEGATIVE: THINK
TENTATIVE: THINK
INTERROGATIVE: THINK
FAVOR: HIGHER

PLACEMENT-OF-ADDRESSEE: higher
SPEECH-SITUATION: formal

The system stores the pragmatic analysis template. The error analysis matcher compares this template with the student input. It then reports any features that are missing or different, as well as error features that are inserted during the analysis. Based on this, the error matcher then formulates appropriate feedback. For example, if a student used the verb sashigerarenai instead of itadakenai for the above sentence, the system would respond as follows:

You seem to have used the giving verb with the wrong direction. You should have used the verb with inward direction.

Our computer assisted instruction system benefits from adopting p-structure in two ways. First, the system allows students flexibility for expressing propositions in different ways, since the system can accept similar information expressed in different structures. Second, the system is able to detect errors and give finer feedback on pragmatic usage of the language. Students can now express the required proposition more freely without burdening the teacher with the task of typing in all possible correct answers and incorrect answers with appropriate feedback.

Acknowledgments: I am grateful to Lori Levin, David Evans, Martin Thurn, and Steve Henderson for their help and guidance.

References