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Inference of Utterance Presuppositions

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Dialogue is a cooperative activity by two agents. Interlocutors share related knowledge and beliefs to cooperate with each other. Knowledge and beliefs that are shared between interlocutors is called ‘mutual belief’ or ‘common ground’. They are grounded through communication based on the presentation of an utterance and the evidence of understanding it. However, it is not always true that an utterance represents all information to be grounded. Participants of a dialogue communicate with each other, with inferring information that is not clearly represented in the utterance.

Recently, question answering systems or spoken dialogue systems came to be widely used. However, these systems usually exchange questions and answers in specific formats. In order to achieve more advanced dialogues, smooth grounding of mutual beliefs is essential and it is important to be able to infer information other than that is not asserted in the utterance.

It is known that presupposition is triggered by some special words or construction structures. They are called ‘presupposition-triggers’. However, most presupposition-triggers shown in books are English. To survey Japanese presupposition-triggers, we clarified Japanese forms and expressions corresponding to English presupposition-triggers.

In this research, we focused presupposition-triggers that trigger grammatical presupposition among presupposition-triggers which Levinson showed. Grammatical presupposition is a presupposition related to the focus of a

sentence, and a content of presupposition is informative related to the specific word or the clause in the sentence. In this research, we analyzed presupposition-triggers which trigger grammatical presupposition. Accordingly, we show classifications of presupposition-triggers that correspond to Japanese forms, and clarify syntactic relations between presupposition-triggers and words or clauses related to presupposition contents.

We call presupposition-triggers of words ‘word-triggers’, and presupposition-triggers of construction structures ‘construction-triggers’. We classified word-triggers according to differences of forms in particular. About construction-triggers, we give names corresponding to Japanese forms according to Japanese grammar by Masuoka and Takubo.

We call specific words or clauses related to contents of grammatical presupposition ‘presupposition-parts’. For word-triggers, we clarified predicate-argument structures and dependency structures between word-triggers and presupposition-parts. For some of word-triggers, presuppositions depend on presupposition-parts. For construction-triggers, we clarified patterns of construction structures, and showed which parts of construction structures are presupposition-parts.

We implemented a system that infers utterance presuppositions. We built the dictionary data using presupposition-triggers we found in this research. We registered words of word-triggers and construction patterns of construction-triggers to the dictionary data. In addition, we also registered presupposition-parts and sentences of presuppositions corresponding to presupposition contents. Registered words of word-triggers are 131, and registered construction patterns of construction-triggers are 17. The presupposition inference system receives results of syntactic parsing and predicate-argument structure parsing of a sentence. The system recognizes presupposition-triggers from the sentence using the dictionary data, and outputs a presupposition sentence with words or clauses that is presupposition-parts.

We did an experiment of presupposition inference using conversation sentences of novels. The experimental results show that 90 presuppositions were inferred from 600 sentences. In the results, 57 presuppositions were correct, and the accuracy was 63%. For word-triggers, 63 presuppositions were inferred by word-triggers, and 41 presuppositions were correct, and

the accuracy was 65%. For construction-triggers, 27 presuppositions were inferred by construction-trigger, and 16 presuppositions were correct, and the accuracy was 59%.