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Abstract

Displacement is one of the defining features of human language. The term refers to the ability to talk about things that are remote in space or time (or both) from the context of the utterance (Hockett, 1960). However, it is not clear which aspects of displacement are unique to human language. Here, we consider displacement in the context of communication (We call this "displaced communication") to clarify what is truly unique to human language. The understanding of displacement is thought to contribute to the study of the origin and evolution of human language.

We classified displaced communication, and distinguished two kinds of displacement, displacement in a broad sense: displacement to tell what the receiver knows, from displacement in a narrow sense: displacement to tell what the receiver does not know. Displacement unique to human language is displacement in a narrow sense, and to realize this, different mechanisms are required. As such mechanisms, we focused on motivated meaning extension, which is to extend the meaning of existing signs based on similarity or proximity by metaphor or metonymy.

In previous research, we focused on the three kinds of studies, the study on the changes of symbol systems in laboratory experiments (Kirby et al, 2008; Fay et al, 2003), the study of metaphor and metonymy as cognitive processes (Lakoff & Johnson, 1980), and the study of pragmatics, especially the relevance theory (Sperbel & Wilson, 1986/95) or lexical pragmatics (Wilson & Wharton, 2009). Through these studies, we proposed three hypotheses related to the formation of displaced communication;

Hypothesis 1: motivated meaning extensions (metaphor and metonymy) are used more in displaced communication to tell what the receiver does not know

Hypothesis 2: motivated meaning extensions are understood through interactions based on mutual hypothesis formation. The qualitative changes of symbol system may occur in such processes.

Hypothesis 3: motivated meaning extensions are sometimes inhibited in the symbol system with strong motivated form-meaning relations.

We designed an experimental framework for displaced communication based on graphical communication task (Fay et al, 2003) to examine the realization process of displacement in a narrow sense. Drawings function as an "iconic" symbol system because the outline of an object can be a symbol indicating that object. Communication through drawings enables us to observe what kinds of changes of symbol system occur during interaction from initial iconic system. We conducted graphical communication experiments to 18 pairs of Japanese native graduates. By comparing two kinds of drawing tasks each corresponds to displacement in a broad sense (Known task) and in a narrow sense (Unknown task), we examined the difference in use of motivated meaning extensions. Drawing tasks are composed of a noun and an adjective; **Known** task: A **familiar** combination of an adjective and a noun, and **Unknown** task: An **unfamiliar** combination of an adjective and a noun.

In the drawings, we observed two kinds of figurative expressions; **Alternative** Expression: Expressions that represent the feature of an absent object with another object that typically has the feature and **Bodily** Expression: Expressions that represent the feature of an absent object with motions and body parts that typically cause the feature.

We also observed that Both alternative and bodily expressions were used together in one picture. Hence there are four types of expressions; Both Alternative and Bodily Expression, and Neither Alternative nor Bodily Expression.

The result of 2×2 ANOVA showed that Both Alternative and Bodily Expression are used more in the latter half of the Unknown task. Both Alternative and Bodily Expression seems to be effective to the receiver's understanding. The relationship between the number of correct noun and adjective suggested that the identification of noun serve to understand adjective. This seems to reflect the structure of conceptual metaphor (Lakoff & Johnson, 1980), in which the feature of the source concept is transferred to the target concept. In addition, we observed examples in which the receivers generated meanings through interactions based on mutual hypothesizing. The receiver formed a hypothesis about what the sender was trying to tell from the drawing. The sender guessed the receiver's understanding from the reply and tried to modify it by drawing a new picture. Through repetitions of these interactions, the receivers came to understand the senders' intentions.

We conducted graphical communication experiments to 5 pairs of deaf undergraduates, who use Japanese Sign Language in daily communication. Sign language is considered to have strong motivated form-meaning relations. We examined whether motivated meaning extensions are inhibited by tendency to use strong motivated form-meaning relations. Deaf participants tended to use Alternative expression more in Unknown task, and Bodily expression more in both tasks, compared to the results of (spoken) Japanese natives'. Deaf participants did not use Alternative expression in Known task. Alternative expression is considered to be a general strategy to tell what the receiver does not know, while Bodily expression seems to be affected by modality of communication. The same relationship between the number of correct noun and adjective was observed in deaf participants' result, which suggests the structure of conceptual metaphor (Lakoff & Johnson, 1980). We also observed examples of interactions based on mutual hypothesizing, in which deaf participant could not identify a noun and an adjective by Alternative expression.

From these results, Hypothesis 1: motivated meaning extensions (metaphor and metonymy) are used in displaced communication to tell what the receiver does not know was supported. Alternative expression is considered to be a kind of conceptual metaphor, which is a cognitive mechanism to understand an abstract object in terms of more concrete object. Bodily expression is considered to be a kind of metonymy, which play a role in directing one's attention to a target, in the combination with Alternative expression.

Hypothesis 2 is also suggested to supported, motivated meaning extensions were understood through interactions based on mutual hypothesizing. The qualitative changes from motivated iconic system to figurative system with metaphor and metonymy occur in the process.

In Known task, deaf participants' did not use Alternative expression and used Alternative expression in Unknown task, but could not identify the task. This result seems to partly support Hypothesis 3: motivated meaning extensions are inhibited in the symbol system with strong motivated form-meaning relations. However, we need more samples and data to clarify Hypothesis 3.