

REMARKS ON SIGN LANGUAGE

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1. Introduction

Since Chomsky (1957, 1965), a number of linguists have adopted a hypothesis that knowledge of language is different from the tasks of speaking and understanding, and have uncovered numerous important properties of language. Significantly, however, Kempson et al. (2001), Cann et al. (2005), among others, challenge this view, proposing Dynamic Syntax. More specifically, they argue that the common-sense intuition is correct that knowledge of language consists in being able to use it in speaking and understanding. Furthermore, Kempson et al. (2001), Cann et al. (2005), Cooper et al. (2008), Kempson and Kiaer (2009), Kempson and Kurosawa (2009), among others, have provided substantial evidence for the claim, based on a study of typologically diverse oral languages such as Arabic, English, Japanese, Korean, and Swahili.

In this paper, I attempt to suggest that Dynamic Syntax should succeed in shedding a new light on the nature of sign languages as well. To attain this aim, in section 2, I briefly summarize the background and nature of Dynamic Syntax, and try to show what kind of insight Dynamic Syntax provides for our understanding of a human language. In section 3, I raise a question as to whether sign language is a real language (cf. Poizner et al. 1987, Crain and Lillo-Martin 1999, Sutton-Spence and Woll 1999, Neidle et al. 2000, Hikijima 2009, Chiba 2010, among others), and I suggest that if sign language is a real language, it should display the deep, dynamic properties of a human language uncovered by Dynamic Syntax, exactly in the same way as oral language does. In section 4, I explain how I endeavor to develop the idea in my future research. Section 5 concludes the discussion of this paper.

2. Dynamic Syntax: Knowledge of Language (Kempson et al. 2001, etc.)

According to a view which has dominated linguistic methodology since the 1950s, natural languages are taken to be definable as a type of formal language. A formal language is usually presented with some basic expressions, from which all and only the well-formed expressions of the language are induced

through recursively applying a set of grammatical rules. Semantic rules then characterize the interpretation of the well-formed expressions constructed by grammar. By analogy with formal languages, a natural language has been considered to have a set of basic expressions. From the basic expressions, a set of well-formed sentence strings are generated by grammar—a finite body of rules and principles which assign all and only the well-formed strings a structure, relative to which a semantic interpretation is defined.

As Kempson et al. (2001) point out, however, under the orthodox view that a natural language is definable as a kind of formal language, the link between knowledge of a language and its application to speaking and understanding is obscure, and the connection has never been fully explained. Moreover, Kempson et al. (2001) argue for the common-sense view of a natural language: knowing a language should mean being able to segment sounds in that language into units, recover information from those units, and use the information to work out what someone communicating in that language has intended to convey. To formalize this common-sense view, Kempson et al. (2001) propose Dynamic Syntax, and define a dynamic architecture for a natural language within which structures are established as interpretation for an uttered language string on a left-right basis, and in which explanations of properties of sentences are couched in terms of how interpretation of a string can be progressively established from a starting point to a logical form as outcome representing an interpretation of the string in context (cf. Sperber and Wilson 1986/95).

As a piece of evidence for Dynamic Syntax, Kempson et al. (2001) and Cann et al. (2005) show the following examples:

- (1) I told every girl that *she* had done well. (variable-type expression)
- (2) Edwina came in. *She* was sick. (referential-type expression)
- (3) I helped an old woman over the road. *She* thanked me. (E-type expression)

(Cann et al. 2005, p. 9)

The pronoun *she* in (1) is called a variable-type expression, and is construed as a ‘bound variable,’ a variable to be construed as bound by the quantifier *every girl*, its interpretation dependent entirely on what range of girls *every* is taken to range over. The pronoun *She* in (2) is said to be a coreferring pronoun, i.e. a referential-type expression. Both the pronoun and its antecedent have the same interpretation, denoting the same individual. The pronoun *She* in (3) is called an E-type expression, and is construed as ‘the old woman I helped over the road.’ The E-type expression requires some type of mental computation.

Interestingly, the phenomenon of these variable-type, referential-type, and E-type interpretations extend systematically across pronouns in all languages. It also extends systematically across anaphoric expressions in all languages. The instances of a variable-type expression and an E-type expression concerning other types of anaphoric expressions are given below:

- (4) Every house I have put on the market I have checked, to make sure *the house* will not be hard to sell. (variable-type expression)
- (5) Most students were there. *The entire group* got drunk. (E-type expression)
- (6) Every day I drink any wine, I know that later *that day* I shall have a migraine.
(variable-type expression)
- (7) Most people who came early left well before a few people got drunk. *That group* were no problem.
(E-type expression)

(Cann et al. 2005, p. 10)

A question here is why these anaphoric expressions show such systematic ambiguities universally. Kempson et al. (2001) and Cann et al. (2005) argue that the meaning of words contained in a sentence is not at all sufficient to establish the interpretation of what is conveyed in an utterance. As Dynamic Syntax predicts, we, humans, articulate meanings for expressions that are systematically weaker than the interpretation they are assigned in an utterance, by progressively establishing the interpretation of each sentence on a left-right basis in a given context. As a consequence of this on-line processing, anaphoric expressions display the above mentioned ambiguities depending on the context in a systematic way. In other words, under Dynamic Syntax, the ambiguities of anaphoric expressions are not lexical ones, but are due to the dynamism of the on-line processing. (The reader is referred to Kempson et al. 2001 and Cann et al. 2005 for their formal analysis of (1-7) under Dynamic Syntax.)

Furthermore, Cann et al. (2005) argue that Dynamic Syntax yields a pleasing way to address together apparently two distinct problems in linguistics,

the ‘compositionality’ problem and the ‘context-dependence’ problem. The problem of compositionality is how words and what they are taken to mean can be combined into sentences across an indefinite array of complexity. This problem is illustrated below:

- (8) Tomorrow, I must see Bill.
(9) Bill, I must see [e] tomorrow.
(10) You insisted I think that Harry, I must interview today and Bill, I must see [e] tomorrow.
(Cann et al. 2005, p. 2)

In (9) and (10), *Bill* is interpreted at the position of the gap [e].

On the other hand, there is the problem of context-dependence. Pronouns are a familiar case as shown in (11-13): they have to be understood by picking up their interpretation from some other expression recoverable from the context. The following examples also show this point:

- (11) He upset *her*.
(12) Though John and Mary adored each other, he married Sue. Whenever he upset *her* subsequently, she would remind him that it was Mary he should have married.
(13) Though John and Mary adored each other, he married Sue. The only time they subsequently met, he upset *her* so badly she was glad he had married Sue, not her. (Cann et al. 2005, p. 8)

(11) means that some male person upset some female individual at some previous point in time—but who upset who and when is not provided by the words themselves. It is provided by the context within which the sentence is uttered. (12) and (13) show the choice is not a trivial matter of picking up on what has most recently been mentioned, but may involve reasoning with whatever information is provided by that context. Consequently, in the case of (12), the pronoun *her* means ‘Sue.’ In (13), *her* means ‘Mary.’

Consider now the following examples:

- (14) There was this owl *which* [e] had got its foot caught in the goal netting.
(15) I watched this woman, *who* [e] had got herself into a dreadful muddle trying to sort out her papers in the middle of the conference hall.
(16) This afternoon I’m interviewing a mature student, *who* [e] is asking for extra time, and we may not be able to avoid giving it to her.

The relative pronoun *which* and the gap [e] in (14) and the relative pronoun *who* and the gap [e] in (15-16) imply that (14-16) concern the compositionality

problem (see 9-10), and appear to have nothing to do with the context-dependence problem.

However, the context-dependence problem does matter in (14-16) as well. Consider the following examples:

- (17) There was this owl *which it* had got its foot caught in the goal netting.
 (18) I watched this woman, *who the idiot* had got herself into a dreadful muddle trying to sort out her papers in the middle of the conference hall.
 (19) This afternoon, I'm interviewing a mature student, *who this woman* is asking for extra time, and we may not be able to avoid giving it to her.

(Cann et al. 2005, p. 14)

The only difference between (14-16) and (17-19) is that the position [*e*] in which the relative pronoun is interpreted is not filled by anything in (14-16), but the position is filled by the anaphoric expressions, *it* in (17), *the idiot* in (18), and *this woman* in (19), respectively (cf. 1-7). In other words, the gap [*e*] in (14) is replaced by the anaphoric expression *it* in (17). The gap in (15) is replaced by the anaphoric expression *the idiot* in (18). [*e*] in (16) is replaced by *this woman* in (19). Thus, a question arises as to why the relative gap [*e*] in (14-16) is replaced by the anaphoric expressions in (14-19). Kempson et al. (2001) and Cann et al. (2005) argue that (14-19) suggest that the relation between the relative pronoun and the gap is equal to that between the relative pronoun and the anaphoric expression. Furthermore, the existence of such anaphoric devices in (17-19) strongly implies that the compositional problem and the context-dependence problem should be addressed together to account for the properties of (14-19), as predicted by the architecture of Dynamic Syntax. (The reader is referred to Kempson et al. 2001 and Cann et al. 2005 for their formal analysis of (14-19) under the framework of Dynamic Syntax.)

3. Sign Language

According to Sutton-Spence and Woll (1999), the Abbé de l'Épée, the great French educator of deaf children in the late eighteenth century, believed that deaf people should use signs, but even he believed that the 'natural gestures' of deaf people needed changing to follow the grammar of French. Many deaf people have been told by English speakers that deaf signing is not as good as English, and they have come to believe this. A linguist named Charles Hockett suggested in the 1960s that there were several 'essential characteristics' of human languages which are not found in other communication systems. As an example, Hockett claims that human languages make use of the 'vocal-

auditory' channel, implying that sign languages, which make use of the 'corporal-visual' channel, are not a real language. Many people may not be aware of it in Japan, but Japanese Sign Language is not yet defined as a language by Japanese legislation, which causes numerous serious problems for the deaf in Japan. For instance, the deaf in Japan do not have rights to learn at schools by means of Japanese Sign Language, or do not have rights to communicate with doctors and nurses at hospitals in Japanese Sign Language.

It is true that a number of linguists in the world have set forth evidence that sign language is a real human language (Stokoe et al. 1965, Klima and Bellugi 1979, Padden and Perlmutter 1987, Poizner et al. 1987, Wilbur 1987, Crain and Lillo-Martin 1999, Sutton-Spence and Woll 1999, Neidle et al. 2000, Hikijima 2009, Chiba 2010, among others). Under the current situation, however, I believe that it is still worth while continuing to examine the nature of sign language in detail and considering if there is any further evidence that we must regard sign language as a language. To do this, I trust that Dynamic syntax, which has been successful in revealing the very nature of language in a novel manner, should provide new perspectives for us (see section 2). I believe that whether we make use of oral language or sign language, we progressively build up the interpretation of an uttered language string on a left-right basis in accordance with the context. It is thus predicted that anaphoric expressions in sign language should display exactly the same systematic ambiguities as those in oral language (see 1-7); there must be a case in sign language in which the compositional problem and the context-dependence problem have to be addressed together (see 8-19).

4. Future Research

Since 2009, I have been receiving lessons on Japanese Sign Language from some of the deaf in Akita. I invited two of my deaf teachers to Akita University on February 21 and September 19 in 2010. On those two occasions, I asked them to give a seminar on the deaf and communication in Japanese Sign Language, and to teach me and my students Japanese Sign Language. My students and I thoroughly enjoyed their seminars and lessons. Thanks to their seminars and lessons, I have started to understand what they express in Japanese Sign Language, and I have begun to understand their situation in Japan in the past and now. I have noticed that there are a number of serious problems around the deaf in Japan, and it is certainly necessary for someone to continue considering if there is any further evidence that sign language is indeed a language. This is so, because once Japanese legislation defines Japanese Sign Language as a language, at least some of the problems the deaf people face in Japan could be eliminated. The

deaf may be able to get access to a variety of information crucial in their life by far more easily than now.

Given the consideration above, I am now planning to receive help for my future research from one of my deaf teachers, who is a native speaker of Japanese Sign Language. Provided with his help, I intend to carry out research on Japanese Sign Language by adopting the framework of Dynamic Syntax. Now, I am particularly interested in finding out if anaphoric expressions in Japanese Sign Language display ambiguities in the same systematic way as those in oral language do (see 1-7); if there is a case in which the problem of compositionality and the problem of context-dependence must be treated together to analyze the properties of sign language properly (see 8-19).

5. Conclusion

In this essay, I have shown the significance of Dynamic Syntax proposed by Kempson et al. (2001). Furthermore, I have suggested that there should be a good possibility that Dynamic Syntax provides valuable new perspectives for us to uncover the nature of Japanese Sign Language. By carrying out further research on sign language, I hope that I should be able to discover new evidence that Japanese Sign Language is a real language, and that based on the evidence, I might even be able to deepen our understanding of both sign language and oral language.

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