

## Situated Language: Case of Japanese

### EXTENDED ABSTRACT

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**Abstract.** Language and thought shape each other, or at least give influence each other. Japanese viewpoint of the world is different from that of western countries, and it is reflected in linguistic structures. Japanese uses insects' view in contrast to Western birds' view. Reflecting this, Japanese language, and therefore thought process, suits use of situated expressions. This talk elaborates on the point and tries to formalize dialog processes in a situated manner.

**Keywords:** language and thought, endo-system and exo-system views, situatedness, case grammar, Japanese language

### 1 Language and Thought

Language and thought shape each other, or at least give influence each other. Benjamin Whorf has one of the strongest claims on this point:

1. Whorf's strong hypothesis (linguistic determinism): thought is determined by the language spoken by that person
2. Whorf's weak hypothesis (linguistic relativity): categorization of concept differs by language and culture

He even claims:

*Newtonian space, time, and matter are no intuitions. They are receipts(sic) from culture and language. That is where Newton got them. (Whorf 1956, p. 153)*

My position is that at least Whorf's weak hypothesis is true. While I stayed at CSLI (Center for the Study of Language and Information), Stanford University, I had discussions on situatedness of thought with many researchers there. I felt a large crevasse lying between my understanding of situatedness and theirs, but I could not figure out the precise point.

Later, I found the source of the difference in a linguistic literature. Yoshihiko Ikegami (2007) reported that the view-point of constructing and understanding sentences are different between Japanese and English. A typical example is illustrated using Yasunari Kawabata's "Snow Country". In understanding the first sentence "国境の長いトンネルを抜けると雪国であった", the reader/hearer identifies himself with the person on the train. In understanding its English translation by E. Seidensticker "The train came out of the long tunnel into the snow country", on the other hand, the reader/hearer is outside the tunnel, probably located in the sky, and watching the train coming out of the tunnel. The original Japanese sentence lacks grammatical subject, which is the train in the English version. Japanese readers fill the information with their commonsense. Takehiro Kanaya takes the same example and claims that Japanese is expressed from insects-eyes-view while English is expressed from birds-eyes-view (Kanaya, 2004).

Kanaya also claims that Japanese is structured around verbs at the center while English is structured around nouns. We will come back to this issue later (Kanaya, 2003). Bin Kimura claims that Japanese primary view of world the world is as “*koto* (events)”, in contrast to “*mono* (things)” (Kimura, 1994). We can see an object, for example an apple, as *mono* that exists outside in the reality. But we can also experience an apple falling as *koto*. In the latter case, the person experiencing the event is included in the event. In other words, Western view detaches human from nature and sees the world as an object while Eastern view puts human in the nature and experience the world. We see essentially the same phenomena as Snow Country example here.

In western languages, acquisition of nouns precedes acquisition of verbs. However, Twila Tardif (1996) reports otherwise. The counter evidence is given from mandarin speakers' early vocabularies. In Chinese, they are sometimes acquired in the reverse order.

Peter Deutsch claims:

*Languages are theories. In their vocabulary and grammar, they embody substantial assumptions about the world. Whenever we state a theory, only a small part of its content is explicit: the rest is carried by the language. (Deutsch 1997, p. 153)*

## 2 View Points

As seen in Snow Country example, the view point of a system is biased by culture and language. Atsunobu Ichikawa (2000) claimed that different cultures have different world views. Western view of the world is from God's eyes view and imposes total consistency of the world. Note that this is also the view of the natural science. Japan, on the other hand allow/accept different rules for different groups. We see a group, such as a family and a company, from inside as a member.

There are Exo and Endo-System Views (Nakashima *et. al.*, 2006). Exo-system view puts the observer outside of the system being observed. Natural sciences, physics in particular, presupposes this view. Although observation affects the system being observed in principle, natural sciences tries to minimize the interferences. However, there are systems that can be observed only by participating in the process. This is where endo-system view is called for. There are trade-offs between objectivity and observability.

## 3 Situatedness

Situatedness is a source of flexibility of living things and intelligence. First of all, evolution and development are situated. We have many examples such as shape of tree, layout of leaves, imprinting of a new born bird, co-evolution and so on.

Situation Theory (Barwise and Perry, 1983) tried to formalize this situatedness in a logical manner.<sup>1</sup> In situation theory, a logical sentence is written as  $s \models \sigma$  that reads a situation  $s$  supports an infon  $\sigma$ .

Examples:

*Japan*  $\models$   $\langle\langle$ time, 4:00 $\rangle\rangle$

*World*  $\models$   $\langle\langle$ time, 4:00, JST $\rangle\rangle$

When a situation gets wider, situatedness gets lower, and thus infons must be larger. My hypothesis is that part of information moves across “ $\models$ ” reflecting the situational change.

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<sup>1</sup> Let me note that logic imposes an exo-system view while situatedness itself is on endo-systems view. Very interesting contradiction.

Japanese is said to be ambiguous in comparison to English. In fact, the level of specificity in general is higher in English sentences. However, this observation holds only when we see the language isolated from its use, in other words, in exo-system view. When we see it in endo-system view embedded in the situation, either as the speaker or the hearer, we see different scenery. Japanese sentence does not specify things that are obvious (and therefore easily available to both the speaker and the hearer) from the situation. Japanese syntax fits better to this kind of situated usage. We will examine this in the next section.

#### 4 Case Grammar

One of the prominent characteristics of the Japanese syntax is the use of particles indicating the case role of the preceding noun phrase. Mikami (1953) classified them as follows:

nominative	が(ga)
accusative	を(wo)
locative	に(ni)
dative	に(ni), へ(he)
ablative	に(ni), から(kara)
instrumental	で(de)
commutative	と(to)

This classification corresponds to surface structure of the language.

Fillmore proposed Case Grammar for English. It is said that his intuition is taken from Japanese grammar. He set the following cases: agent, instrument, experiencer, object, location, source, goal, time and benefactive. Fillmore (1985) classified cases by their semantics (deep structure) and proposed a case grammar. He studied the co-appearance of cases with a verb, and classified cases into mandatory and optional ones. He then classified the meaning of a verb using the case frames. For example, the verb “break” has three case frames:

subject:O  
 subject:A object:O (with: I)  
 subject:I object:O

In English, “A window broke” and “The thief broke the window” fall into different case frames. Presence of the object role is the syntactic key. Roles of the subjects differ in these two cases. In Japanese, on the other hand, these are differentiated by the use of a modality, reru (voluntarity).

The corresponding cases in Japanese are indicated by particles (surface structure). A Japanese sentence is structured around a predicate as the core with additional cases attached with particles. This structure allows flexible construction of a sentence: Only those elements unavailable from the context (situation) are explicitly stated in the sentence.

Let us study the corresponding Japanese sentences.

Case frame	English	Japanese
subject:O	The window broke.	窓が割れた (mado ga wareta)
subject:A object:O	A thief broke the window.	泥棒が窓を割った (dorobo ga mado wo watta)
subject:I object:O	A hammer broke the window.	金槌が窓を割った (kanazuchi ga mado wo watta)

Organic Programming language Gaea (Nakashima *et. al.* 1997) was designed to allow situated representation of programs. In Gaea, the above examples are expressed as follows:

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break(mado@ga).
break(dorobo@ga, mado@wo).
bread(kanazuchi@ga, mado@wo).
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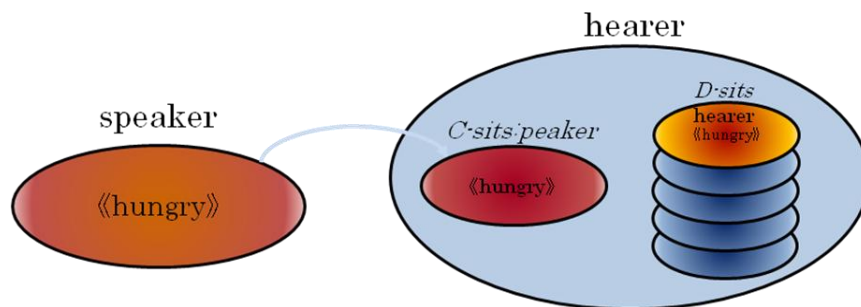
## 5 Japanese is not “Ambiguous” but “Properly-specified”

We have seen that the syntax of Japanese is suitable for situated representation, in which only necessary information can be explicitly stated. All other information can be retrieved from the situation.

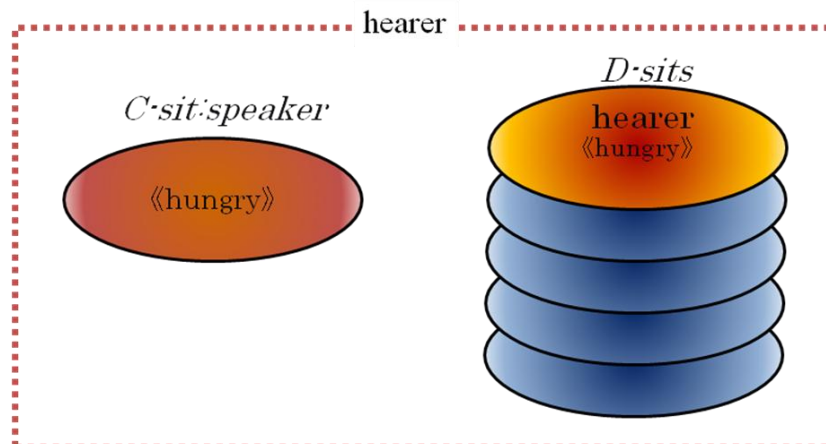
In processing written or spoken language, the reader/hearer must also maintain proper structure of situations. A special particle は(*ha*) is used to shift to a new situation.

Here is the summary of the mental representation of a dialog (Nakiashima and Harada, 1996). The attention is focused on a particular situation through inference linguistic cue (use of “*ha*”). The current (mental) situation, called C(urrent)-sit, on which attention is focused, is maintained. There are also other situations to form the background context of the dialog. An ordered list of situations, called D(efault)-sits, is maintained to keep track of them. When necessary information cannot be obtained from C-sit, then the list of D-sits are searched one by one.

Let us consider a very simple example. When the speaker says “hungry”, the hearer must put the information in the speaker's situation, not the hearer's situation.



Note that the above picture is given from exo-system view. Actual representation of the hearer is from the endo-system view depicted below.



## 6 Summary

Western and Eastern view of the world correspond to theorist view and agent view respectively. Japanese language is developed under Eastern view and Eastern view in Japan is developed under Japanese language. Under this view, Japanese is not ambiguous. Japanese sentences specify only necessary elements.

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