The acquisition and interpretation of English locative constructions by native speakers of Korean

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Abstract

The English "locative alternation" relates sentences of the type "John loaded hay onto the wagon" to those of the type "John loaded the wagon with hay." Some "locative" verbs occur in both of these patterns; others in only one or the other. It is known that there are differences among languages with respect to which verbs are possible.

The present research focusses the "constructional meaning" of the locative alternation and on the constraints on what verbs can participate in the alternation. One characteristic of the "ground-object" locatives is that the object tends to be viewed as "completely affected." This is known as the "holism effect." In addition, English has certain "narrow constraints" on the verbs which can occur in the two constructions. This study investigates whether native speakers of Korean learning English develop knowledge of the holism effect in English locative and knowledge of the the narrow constraints. English native speakers and Korean learners of English participated in a forced-choice picture-description task. Native speakers of Korean also judged an equivalent test instrument in Korean.

The primary results are these: when given a ground-object structure both learners and English native speakers preferentially choose a ground-holism picture. We interpret this as a reflection of the holism effect: learners, like native speakers, have knowledge of this aspect of the constructional meaning of the locative. In addition, English native speakers show their knowledge of the narrow conflation classes by rejecting ground-object structures which contain verbs which are not permitted in this structure, even if the picture would be appropriate. Korean learners show no effect for narrow verb class. We interpret this as showing that the learners have not achieved native-speaker knowledge of the narrow classes. Korean uses a different basis for verb classification.
INTRODUCTION AND RATIONALE

This paper investigates two aspects of the acquisition of argument structure alternations in a second language: first, "constructional meaning" as it is sometimes called (and which is related to Pinker's (1989) concept of "broad range rule" and "broad conflation class"); second, specific constraints on the classes of words (verbs) which can occur in a construction (this is related to Pinker's of "narrow-range rule" and "narrow conflation class").

Constructional meaning, object-holism, and the locative alternation

A given construction in a language is associated with a particular constructional meaning, where "meaning" here is used in a most general sense, to include not only aspects of truth-value semantics ("literal meaning") but also of "perspective" and features of discourse and pragmatics. Thus, we assume that there is "no distinction without a difference" (Bolinger, 1968; Goldberg, 1995; among many others): If a language has a constructional alternation, it makes a difference which alternative is chosen.

Our focus here is the two constructions which constitute what is called the locative alternation, exemplified by the pair:

Kim loaded the wagon with hay
Kim loaded hay onto the wagon.

In examples such as these, there is one entity which moves to a location. This (the "theme") we will call the "figure" argument, the hay in this example. Then, there is an entity with respect to which the figure moves: the "ground" (elsewhere variously called "goal" or "location"), in this example the wagon. In one of the alternatives under study, the figure is the direct object (I loaded hay onto the wagon); in the other the ground is the direct object (I loaded the wagon with hay). Following convention, we will use the terms "figure-object construction" and "ground-object construction", or "figure construction" and "object construction," for short.

One aspect of constructional meaning which differentiates the locative alternates is the so-
called "object-holism effect." It seems that, especially in the case of the ground-object construction, the direct object is presented as "wholly affected." In the example *Kim loaded the wagon with hay* the wagon is presented as being completely full. On the object-holism of the locative, see esp. Rappaport and Levin (1985) and Pinker (1989).

Let us emphasize that this is a matter of "presentation" and viewpoint. It is not the case that there is some external objective feature present in the event itself by which *Kim loaded the wagon with hay* cannot be truthfully asserted if there is some room left in the wagon. It would be better to say that the sentence "presents the wagon as wholly affected" or "emphasizes the resultant fullness of the wagon." Therefore, given the constructional meaning of the locative, it is more likely to be used of a situation in which the object is "completely affected". In our experimental results, we found that speakers are able, though less likely, to use a ground-object "load" construction in the face of partly empty wagons.

The holism effect in the locative alternation is related to a more general "object affectedness" property (Gropen, et al., 1991) which transitive constructions generally share (or "inherit", to use the terminology of Construction Grammar, see Goldberg, 1995, pp. 72 ff.), though it may show up in slightly different forms in different constructions and in different languages (in the possession constraint on the ditransitive dative, for example (Pinker 1989; Bley-Vroman & Yoshinaga, 1992) and in the various other transitive constructions in different languages (Foley & Van Valin, 1984).

**Narrow-class constraints on verbs occurring in the locative alternation**

In English, many verbs can occur in both alternates:

- I sprayed paint on the statue
- I sprayed the statue with paint

We shall call these "alternating verbs."

Some verbs occur only in the ground construction, not in the figure-object construction:
I filled the glass with water.
*I filled water into the glass.

We shall call these "figure verbs".

Some verbs occur only in the figure-object construction, not in the ground-object construction:

I poured water into the glass.
*I poured the glass with water.

We shall call these "ground verbs".

It is crucial for our rationale that membership in these classes is not completely predicted by the broad constructional meaning of the locative. For example, although pouring paint over a valuable statue can affect it as completely as spraying paint on it, one can naturally say "The vandal sprayed the statue with paint" but not "The vandal poured the statue with paint." (See Bley-Vroman and Yoshinaga (1992) for an application of the concept of “motivation” to the acquisition of the narrow constraints on the dative.)

The study of the acquisition of broad constructional meaning and of narrow verb classes has been of considerable interest to students of second language acquisition. The acquisition of broad constructional meaning involves reference to such basic cognitive-linguistic concepts as acting, being affected, moving, changing, causing, etc. --concepts which are often associated with the theory of thematic roles, whether primitive or decomposed. In forming constructional meaning, the learner must pay attention to the association of thematic properties with a syntactic pattern. It seems that such concepts are universally used in human languages and could be "accessible" to foreign language learners, either because they are present in the L1 or because they are basic to the language faculty (it is difficult to distinguish these ideas practically). We thus might expect, on general grounds, that the holism effect for the locative alternation would be evidenced by foreign language learners of English.
The acquisition of narrow semantic constraints and associated narrow semantic verb classes is much trickier. Here, the learner must first have a system which structures the semantic space of verbs along the right dimensions, so that the verbs which form coherent narrow classes are contiguous in this space (Goldberg, 1995, pp. 133-136). In Pinker's formulation, the learner has a privileged list of manners and properties (presumably part of Universal Grammar) which are the potential defining characteristics of the narrow classes (Pinker, 1989, pp. 183 ff.) These manners and properties would distinguish, for example, a verb of the "pour" class from a verb of the "sprinkle" class. Then, the learner must note that a particular class can occur in the construction and must conservatively conclude that only classes which have been exemplified can occur. (One might also couple this with some sort of indirect negative evidence: for example, if the learner hears "I poured paint on the statue" in (many?) situations in which the statue is completely affected and in which a ground-object pattern with therefore be expected, the learner might conclude that the ground-object pattern is not possible with verbs of the narrow class of pour. )

Conceptually, therefore, the acquisition of narrow constraints involves a serious "negative evidence" problem: the learner must determine what verbs cannot occur in a construction--exactly the sort of situation which Universal Grammar is set up to deal with, in this case via a UG-given system of grammatically relevant manners and properties and a learning system which is class-wise conservative. The difficulty posed for learners by such negative-evidence situations is well-known in SLA research.

Previous research has suggested that the broad conflation classes (for example the possession constraint on the dative) the narrow-class constraints indeed seem both more difficult to acquire and heavily susceptible to native-language influence. See, among others, the studies of Bley-Vroman and Yoshinaga (1992), Sawyer (1995), Juffs (1996), especially for ground-class locatives, and Inagaki (1997). The picture is far from complete. We have results for Japanese learners of English with respect to the dative. However, it is not clear whether these results will hold up when a broader range of languages is investigated. Locatives have been studied, by Juffs (1996) with respect to Chinese, but, there, the research was not specifically designed to deal with narrow-class membership in contrast to constructional meaning.

We chose to study Korean learners of English. Some research on Korean as a native
language (e.g. Choi & Bowerman, 1991; Lee 1997) has suggested that the Korean locative alternation might not have equivalent narrow class constraints to those of English, though there is some reason to believe that a holism effect may obtain. Korean provides us with an opportunity to see if the same general picture—broad constraints yes but narrow constraints no—would apply to the acquisition of a hitherto unstudied pair of native language and alternation. And, because there is little experimental data on the Korean locative, and the status of both broad and narrow constraints is not certain, it seemed likely that our research might contribute to this area as well.

THE EXPERIMENT

Instrument and experimental rationale

To investigate the knowledge of the locative alternation—both of the broad holism effect of the constructional meaning and of the narrow verb classes constraints—we used a forced-choice picture description task. The experimental task presents a sentence of English—either a figure-object sentence or a ground-object sentence—and two story-strips illustrating an event. In one of these illustrations, the ground argument is presented as wholly affected. In the other picture, the ground argument is presented as not being wholly affected. Subjects were asked to choose which picture best went with the sentence. Subjects were to mark "neither" for sentences were not possible in either situation (i.e. for ungrammatical sentences).

Figure 1 shows an example item from the test.

[Insert figure 1 about here]

The first scene of both options is same. It shows what John is doing. But the second scene is different. The door has been sprayed completely only in option B. This is the "ground picture"; the other, in which the door is not completely covered with paint is the "figure picture." We reasoned that because of the holism effect, English native speakers would tend to pick the picture with the completely painted door over the picture with the partly painted door, if presented with "John sprayed the door with paint", but would be show a
lesser tendency to do so if presented with "John sprayed paint on the door."

Put differently, if a ground-object sentence is presented, then a ground picture is more likely to be chosen than when a figure-object sentence is presented. That is, an independent factor in the study is whether ground or picture structure is presented. The dependent measure is the number of ground-picture choices for verbs of a particular narrow class.

We used twelve verbs--four alternating verbs, four ground verbs, and four figure verbs, based on the classification of English locative verbs reported by Rappaport and Levin (1985) and Pinker (1989), as follows:

Figure class: pour, spill, glue, nail
Ground class: fill, cover, decorate, pollute
Alternating class: load, pack, spray, sprinkle

Each verb was presented in both locative structures, so the total number of items is 24.

We reasoned that if the narrow-class constraints have been acquired, there will be an effect for the independent factor of membership in the three-way classification we have presented. Specifically, the ground pictures will not be chosen even when a ground construction is presented if the verb presented is a figure-class verb. Statistically, there will be an effect for verb class, as well as for structure.

Participants

There were two groups of participants: English native speakers, (17 participants) Korean learners of English (59 participants).

The Korean learners of English are all college students in Seoul, Korea, whose TOEFL score varies from 550 to 650; they are what are normally called "high-level" learners in SLA studies. They would be qualified to study at many American universities.

We also administered a Korean-language version of the instrument to Korean native
speakers, believing that a qualitative comparison of the behavior of these subjects would help elucidate the results of the English-language version. Sixteen participants took the Korean-language version. We will return to a more detailed discussion of the Korean instrument in the discussion section.

RESULTS

English native speakers and Korean learners of English

The results are shown in the means tables (Tables 1 and 2) and displayed graphically in Figures 2 (English) and 3 (Korean learners of English), and the results of an analysis of variance are shown in Table 3 and Table 4, respectively. The dependent variable is the frequency of ground-picture responses (”groundness” in the figures). Factors are type of structure (ground-object or figure-object) and narrow semantic verb class (alternating verbs, ground verbs, and figure verbs). The experiment-wide alpha level is .05; for each separate ANOVA, it is .025. The null hypothesis is that each sentence will be matched with the ground picture with equal frequency.

[Insert figures 2 and 3 about here]

[Insert tables 1, 2, 3, 4 about here]

The main effects for structure and for verb class are statistically significant for native English speakers. However, in the case of the learners, there is no significant effect for verb class: only structure and the interaction of the two variables are significant.

The main effect for structure, in both groups, as reflects the fact that they chose ground pictures more often when given a ground structure. We interpret this as a reflection of the holism effect: they have knowledge of this aspect of the constructional meaning of the locative. The interaction indicates that the effect of class is dependent on the choice of structure, but there is no consistent effect for class across structures. As a whole, the results show a higher ratio of the choice of ground-pictures given a ground structure than that of the choice of figure-pictures given a figure structure, which means both native speakers and
learners of English tend to prefer ground-pictures to figure-pictures with both structures in this test.

We interpret the main effect for verb class in the English native-speaking group as reflecting their knowledge of the narrow-class constraints. As seen in the graph of English speakers in Figure 2, the means of the figure class are low in the ground structure because the ground structure of the figure class is ungrammatical, for example, *John poured the glass with water. Also, the means of the ground class are low in the figure structure for the same reason. But the means of alternating class are higher than those of other classes, since alternating verbs allow both structures. In this case, it is not a grammar problem, but a preference tendency. However, in the graph of the learners, the means of the figure class in the ground structure or the means of the ground class in the figure structure are similar to that of other classes, because they are not sensitive to the differences in grammaticality among the classes. Figure 3, shows graphically this lack of effect for verb class: in the learner data, the patterns of three classes are not different from each other.

The Korean-language version

Though Korean grammar itself was not the focus of the study, preliminary qualitative comparison of the behavior of Korean and English subjects judging their own native language sheds additional light on interpretation of the learner results. As mentioned above, a Korean-language translation-equivalent version was given to Korean native speakers. This Korean version is not appropriately analyzed using the statistical framework we used for English, and there is no way to compare the results directly using a standard statistical model. The reason is that what is a legitimate independent factor for English turns out not to be a legitimate independent factor for Korean, since it became clear from the results that the verbs evidently do not classify in the same way. Attempting to invent new factors for the Korean results also is unsatisfactory. For one thing, the class membership would only be post-hoc. For another, our choice of verbs for the study is a reflection of an analysis of English and would presumably not be an adequate reflection of the Korean situation, which might well require different numbers of verbs in different classes. And, even if a post-hoc re-classification of the English verbs could be justified, the analysis of variance would have unequal cell frequencies both within the Korean version and in comparison with the English,
further making our statistical analysis problematic. (If one does an analysis on the Korean data simply using the same model as used in English, nothing much turns out to be significant or interpretable, and not much can be concluded except that the model is inappropriate.) Therefore, the Korean results will be discussed here qualitatively and discursively, as appropriate for an exploratory work.

Our preliminary analysis is this. For certain Korean verbs, a figure picture was more often chosen, rather than a ground picture; for others the ground picture was generally chosen; and for some verbs, both choices seemed possible. Let us call these groups respectively the Korean figure-meaning group, the ground-meaning group, and the alternating-meaning group. The group membership, in this analysis, turned out as follows:

a. Figure meaning group: pwutta (pour)
   pwuchita (glue)
   sitta (load)
   ssata (pack)
   ppwulita (sprinkle)

b. Ground meaning group:
   epciluta (spill)
   motpakta (nail)
   oyemsikhita (pollute)

c. Alternating meaning group:
   chawuta (fill)
   tepta (cover)
   cangsikhata (decorate)
   chawuta (fill)

Clearly, this division does not reflect the narrow-class divisions of English. Korean itself could not provide the basis for learners to acquire English narrow classes. To discuss the possible Korean basis for the classification would take us too far afield. But, see Joo (in
preparation) for some ideas, relating to the differing conflation patterns of English and Korean, following the ideas of Talmy (1985).

Consider now holism in the Korean-language version. Here, one needs to focus on the tentatively identified Korean "alternating-meaning" class. The patterns are not completely clear, but it appears that alternating verbs used in a ground-object construction will be associated with a ground picture, as in English. A particularly clear example is tepta 'cover'. Given a sentence such as Minsu-ga chen-ul thakca-ey tepessta 'Minsu covered cloth on the table', the participants selected the picture in which the table is covered in part rather than the one the table is completely covered with the cloth. On the other hand, when the sentence Minsu-ga thakca-lul chen-ulo tepessta 'Minsu covered the table with cloth' is given, the participants preferred the picture showing that the table is completely covered with the cloth. This is the same pattern shown by English native speakers.

DISCUSSION

The results show that Korean learners do come to acquire the holism feature of the constructional meaning of the locative. That is, in learning a construction, they can learn the broad properties of constructional meaning, including such features as object-holism. Presumably this may be aided by exposure to positive examples of this construction (and other transitive constructions) used in context, combined perhaps with some sort of "positive transfer" from the native language. It is important to note that if object-holism is coming from the native language, it is coming at a level of abstractness well above these particular examples. Specifically, those cases of object-holism in Korean of which we have evidence involve a different class of alternating verbs from that of English. Clearly, the "transfer" is not at the level of translation-equivalents, nor perhaps even at the level of the locative alternation. Rather, there must be a more abstract (transitive) construction of which the specific facts of the language-specific locative are inherited.

In contrast to holism, the narrow-class constraints seem not to be readily learned. Arguably, the lack of correspondence between English and Korean creates a situation in which the learner is not able to discern which specific semantic features of verbs are required for occurrence in a particular construction. This would follow from the proposal of Bley-Vroman
(1997), where it was claimed that the elements out of which a foreign-language grammar must be built are exactly those which are either (1) present in the L1 or (2) present ("evident" in the input). Holism is not only supported (at an abstract level) by the native-language grammar, it is also plausibly more "readily apparent" in the contextualized input than are the narrow-range constraints, particularly as the determination of the narrow-range constraints may require something like noticing non-occurrence.

What knowledge of narrow classes can be obtained? Other studies of second language acquisition have produced some evidence that learners may come to know, for particular verbs, whether they are likely to occur in a particular construction. But, this is not necessarily the same thing as knowing the classification basis. For example, Yoshinaga and Bley-Vroman noted a difference in their learner subjects' behavior on grammaticality a judgement test based on whether the verbs presented were real English-language verbs or made-up verbs of the same narrow semantic classes. While native English speakers seem to be able to "act on principle," applying the narrow constraints even in the case of novel verbs, learners seem to be relying more on what has been heard or what has not been heard. In a related experiment to the one presented here Joo (in preparation) shows, using a different methodology, that Korean learners do seem to be able to make judgements about grammaticality, at least for specific verbs in specific contexts. Joo suggests that this is because learners are explicitly taught a given verb in a given structural pattern, and they can apply this knowledge in a forced grammaticality judgement test, though they do not show it in the more meaning-oriented picture-choice test described here.

We speculate that the following general picture will turn out to be accurate: Learners will have knowledge of broad constraints, even at a rather abstract level, but that principled knowledge of narrow classes is difficult or impossible to attain, although learners may be able to associate (in an "unprincipled" way) given verbs with given constructions, due to input exposure or even to explicit presentation.
References


