Second language learnability and the acquisition of the argument structure of English locative verbs by Korean speakers
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The present research focuses on Korean English as a foreign language (EFL) learners’ knowledge of the locative alternation (e.g., *John loaded hay onto the wagon* / *John loaded the wagon with hay*) and its relationship to theories of language-particular and language-universal properties. Korean, the native language of the participants, has a locative alternation resembling that of English. However, although Korean and English are similar in terms of broad-range constraints, they are dissimilar in terms of narrow-range constraints for locative alternations. This study investigates whether the acquisition of such constraints in English locatives by Korean speakers, and whether the first language (L1) influences the second language (L2) acquisition of locative alternations. Two instruments are used in the experiment: a forced-choice picture-description task and a forced-choice sentence selection task. The study investigates an experimental group of Korean learners of English and a control group of native speakers of English. The results are discussed with reference to universality of linking, to the transfer of argument structure and to Pinker’s learnability theory. The primary results are:

- The Korean learners of English had acquired the constructional meaning of the locative construction (which is related to Pinker’s (1989) concept of broad-range rules and broad conflation classes), a property claimed to be universal.
- They had not achieved native-speaker knowledge of language-particular properties – which narrow conflation class verbs belong to – so that they did not reject ungrammatical sentences; and
- Significant L1 transfer effects were not found.
I Introduction

The issue of learnability in the acquisition of argument structure alternations was first investigated in first language (L1) research (e.g., Green, 1974; Baker, 1979; Bowerman, 1982; Gropen, 1989; Pinker, 1989; Gropen et al., 1991; Brinkmann, 1997; Lee, 1997; Kim, 1999). More recently, second language (L2) researchers have turned their attention to the learnability issue in the acquisition of dative alternations (Bley-Vroman and Yoshinaga, 1992; Wolfe-Quintero, 1992; Inagaki, 1997) and locative alternations (Juffs, 1996a, 1996b; Bley-Vroman and Joo, 2001). This article explores the acquisition of locative alternations by Korean learners of English as a second language by re-examining and expanding Bley-Vroman and Joo (2001).

Pinker (1989) discusses a learnability issue that was first pointed out by Green (1974) and later raised by Baker (1979). This learnability issue asks how children succeed in the acquisition of argument structure with little ‘negative evidence’, or evidence about ungrammaticality (Brown and Hanlon, 1970). This learning paradox results from three factors:

- the lack of negative evidence;
- productivity of children’s argument structure use, i.e., over-generalization errors (e.g., I filled salt into the bear, from Bowerman, 1982); and
- arbitrariness in the choice of argument structure (Pinker, 1989).

Regardless of productivity in language use and arbitrariness in a verb’s argument structure, children acquire adult-like knowledge without negative evidence. Pinker (1989) argues that children constrain the application of the alternation rules using semantic criteria:

- broad-range rules and conflation classes constraining the selection of argument structure; and
- narrow-range rules and conflation classes distinguishing verb classes.

For example, locative verbs that denote a transfer of a substance or set of objects (the theme, content, or figure) into a container or onto a surface (the goal, container, location, or ground) are exemplified by these two constructions (Pinker, 1989: 49):

1) a. Kim loaded hay_{figure} onto the wagon_{ground} \rightarrow \text{figure-object frame}

   b. Kim loaded the wagon_{ground} with hay_{figure} \rightarrow \text{ground-object frame}
As seen in (1), the verb *load* alternates between an ‘_____ NP\textsubscript{1} onto NP\textsubscript{2}’ construction and an ‘_____ NP\textsubscript{2} with NP\textsubscript{1}’ construction. Broad-range rules for locativization convert a predicate meaning ‘X moves Y into/onto Z’ as in (1a) into a second predicate meaning ‘X causes Y to change its state by means of moving Z to Y’ as in (1b) (Pinker, 1989: 64). In other words, the argument structure in (1a) represents the manner of motion, but the one in (1b) represents a change of state resulting from the motion. Pinker calls these two basic semantic structures broad-range constraints, which capture commonalities in constructional meanings. In relation to these broad-range constraints, the holism effect is often mentioned. In example (1b), the wagon is presented as being completely full (Anderson, 1971). However, the figure-object construction does not necessarily have to be interpreted holistically. In other words, in (1a) the wagon is not necessarily full.

However, not all locative verbs alternate like *load*. *Arbitrariness* in the choice of argument structure refers to the fact that other locative verbs make different demands on which arguments can be expressed as direct object, as seen in (2) and (3).

\begin{enumerate}
\item a. John poured water\textsubscript{figure} into the glass\textsubscript{ground}.
\item b. * John poured the glass\textsubscript{ground} with water\textsubscript{figure}.
\item a. * John filled water\textsubscript{figure} into the glass\textsubscript{ground}.
\item b. John filled the glass\textsubscript{ground} with water\textsubscript{figure}.
\end{enumerate}

Verbs such as *pour* or *fill* do not take both frames as *load* does. Thus, locative verbs can be divided into three syntactic classes:

- the ‘figure verb class’, which takes only the figure-object frame (such as *pour*);
- the ‘ground verb class’, which takes only the ground-object frame (such as *fill*); and
- the ‘alternating verb class’, which takes both figure-object and ground-object frames (such as *load*).

Verb-by-verb choosiness arises because verbs with certain meanings only allow one or the other semantic structure and argument structure. Based on detailed analyses of the meanings of 128 English locative verbs, Pinker (1989: 127–28) presented three figure-oriented non-alternating, four figure-oriented alternating, five ground-oriented non-alternating and two ground-oriented alternating narrow-range conflation classes. The verbs in a class
share certain semantic features and accordingly show similar
behaviours in the selection of their argument structure. Some of the
narrow-range classes that were included in this study are presented
in (4).

4) Narrow-range classes of English locative verbs (from Pinker, 1989: 126–27)

- **Pour** class (figure-oriented non-alternating): A mass is enabled to move
  via the force of gravity. Examples include *dribble, drip, drizzle, dump, ladle, pour, shake, slop, slosh, spill*.

- **Spray** class (figure-oriented alternating): Force is imparted to a mass,
  causing ballistic motion in a specified spatial distribution along a
  trajectory. Examples include *inject, spatter, splash, splatter, spray, sprinkle, squirt*.

- **Cover** class (ground-oriented non-alternating): A layer completely covers
  a surface. Examples include *cover, encrust, face, inlay, pave; fill* is also
  similar, with one more dimension.

- **Load** class (ground-oriented alternating): A mass of a size, shape, or type
  defined by the intended use of a container is put into the container,
  enabling it to accomplish its function. Examples include *load, pack, stock*.

1 *Research in first language acquisition*

It is widely assumed that there are consistent correspondences
between verb meanings and verb syntax (Pinker, 1989; Gleitman,
1990; Gropen *et al*., 1991; Naigles, 1996; Kim, 1999; Kim
*et al*., 1999), even though researchers take different stances on how learners
come to have those correspondences. Researchers who believe in
syntactic bootstrapping (Gleitman, 1990; Naigles, 1996) argue that
syntactic information is necessary for the acquisition of those
syntax–semantics correspondences, whereas Pinker (1989) claims
that semantics play a more important role. The results of Gropen
*et al*.’s (1991) experiments suggest that adults have knowledge of
these syntax–semantics correspondences in English locative
alternations and children also do but not perfectly. They presented
made-up locative verbs to English-speaking children and adults and
asked them to describe scenes with the verbs. The participants
tended to express figure as direct object when the meaning of the
verb specified manner of motion, and ground as direct object when
it specified change of state. These experiments support Pinker’s
broad-range conflation classes and rules.

Other research has called into question Pinker’s narrow-range
subclasses. Naigles (1991) expressed scepticism regarding the
narrow-range classes, saying that they are based primarily on
Pinker’s own intuition of semantic relatedness without any theoretical rationale or experimental data, and that some subclasses do not seem to be well differentiated only by subtle semantic distinctions. Kim (1999) also suggested that some verbs in an alternating narrow-range class do not show the same syntactic possibilities as the other verbs in the group in terms of prepositional phrase (PP) omission, i.e., whether the PP argument can be omitted. However, despite their critical observations, Naigles and Kim do not present their own solution to how children learn these language-specific narrow-range classes.

Kim (1999) and Kim et al. (1999) made a contribution to studies on locative verbs by investigating these verbs cross-linguistically. They found two language groups:

- an English-type language group that includes figure/ground non-alternating and alternating verb classes, such as English, French, Spanish, Singapore Malay and Classical Arabic; and
- a Korean-type language group that has figure non-alternating and figure/ground alternating verb classes, but not ground non-alternating classes, such as Korean, Japanese, Chinese, Thai and Turkish.

They claim that 3–4-year-old children know which group their language belongs to and use the language-specific syntax–semantics correspondences. An important question following from this is how children get to know their language group. They found that the two language groups differ in terms of the availability of the complex predicate known as V–V compounding or verb serialization and claim that it is the key for children to get to know which group their language belongs to (for details, see Kim et al., 1999). However, their explanation is not convincing since the correlation between complex predicates and locative verb syntax may be incidental.

2 Research in second language acquisition

In second language acquisition, the learnability issue becomes more complicated because other variables such as L1 transfer, proficiency level, instruction, etc. also intervene. The main question is whether

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1Pinker classifies all of the smear-class verbs as figure-oriented alternating verbs. However, Kim suggests that although spread, smear and dab can be defined as figure-oriented alternating verbs as Pinker did, other verbs like rub and paint can be defined as ground-oriented alternating verbs on the basis of PP omission tests (e.g., John piled books (into the shelves) vs. John piled the shelves *(with books)*, from Kim, 1999: 42).
second language learners can have native-like knowledge of argument structure alternations and, more specifically, whether they have knowledge of broad-range classes and narrow-range classes. Unlike L1 learners, L2 learners often do not seem to overcome learnability problems. Previous research has shown that L2 learners do not acquire native-like knowledge of constructional alternations – the dative alternation (Bley-Vroman and Yoshinaga, 1992; Wolfe-Quintero, 1992; Inagaki, 1997) and the locative alternation (Juffs, 1996a; 1996b) – especially as regards eliminating negative exceptions.

Juffs (1996a; 1996b) conducted an experiment on the acquisition of locative verbs by English as a foreign language (EFL) learners in China. He hypothesized that since Chinese has a wider grammar than English, Chinese-speaking learners would have difficulty in learning ground-oriented non-alternating locative verbs such as cover, block, decorate and stain. In the elicited production task, the advanced Chinese learners seemed to behave in a way similar to the native speakers of English except that they produced more figure-object frames for alternating verbs than the native speakers did. However, in the grammaticality judgement task, the advanced Chinese learners accepted figure-object frames for container-oriented non-alternating verbs which are not possible in English (for details, see Juffs, 1996a). Sawyer (2002) replicated Juffs’ experiment with Japanese-speaking learners of English whose TOEFL scores ranged between 380 and 550. His results were also similar to Juffs’.

Based on Choi (2001), Choi and Lakshmanan (2002) tested 20 adult Korean learners of English in the USA and 10 native speakers of English on locative verbs. First, they conducted a pretest, which was a grammaticality judgement task for locative alternations. Based on the scores of the pretest, the participants were divided into two proficiency groups, the intermediate group and the advanced group. Choi and Lakshmanan claim that the advanced group (participants who got 16 points or above out of a maximum of 20 in the pretest) performed similarly to native speakers and thus the learners had native-like knowledge of English locative argument structures at a narrow-range level. They then gave a picture-cued sentence interpretation task first in English and,
secondly, in Korean, in which each sentence was presented accompanied by a set of three pictures which differed in affectedness of the ground (complete/half/little affectedness). The participants had to judge how acceptable each picture was with its given sentence (for details, see Choi and Lakshmanan, 2002). Based on the results of the interpretation task, Choi and Lakshmanan claim that the Korean learners failed to share the same spatial interpretation as the native speakers for ground-object frames of both non-alternating and alternating verbs and that the learners’ interpretations in English were similar to their own interpretations in Korean. This may be due to L1 transfer, as Choi and Lakshmanan argue, or to methodological problems in the tasks because the learners’ responses were consistent in both languages and even throughout all the verb classes and frames.

3 Korean locative verbs

In order to interpret learners’ responses to English locative constructions in the study reported in Section II below, Korean locative verbs should also be described. Korean has a locative alternation resembling that of English. Compared to English locatives, two questions about Korean locatives can be raised:

- whether an equivalent constructional meaning – the holism effect – exists in Korean; and
- whether Korean locative verbs behave in the same way as their equivalent English ones.

The answer to the first question, i.e., whether an equivalent constructional meaning-holism effect exists in Korean, is controversial. The question of the universality of the holistic interpretation is related to the universality of linking rules. Pinker (1989) argues that linking rules are universal; in locatives, they link the argument that is specified as ‘caused to change’ in the main event of a verb’s semantic representation to the grammatical object. In ground-object constructions, the ground is the affected entity in the semantic representation of the verb and is linked to the direct object. In Korean as well as in English, an argument seems to be encoded as a direct object when it is affected in a specific way in the semantic representation of the verb. According to Gropen (1989) and Pinker (1989), the Object Affectedness linking rule results in a holistic interpretation. Speakers choose to use the ground as the direct object when the ground is completely affected rather than when the ground is partly affected.

Choi (2001) argues that Korean locative verbs do not convey a
holistic interpretation in ground-object construction types. By contrast, Lee (1997) suggests that an equivalent holism effect exists in Korean locative constructions based on the results of her experiments. However, she stated that the holistic interpretation is weak in Korean and that it becomes strong when the intensifying adverbs *wancenhi* or *katukhi* (‘completely’) are inserted.

5) a. Minsu-ka mwul-ul wancenhi kulut-ey chaywuta.
   ‘Minsu completely filled water into a bowl.’
   b. Minsu-ka kulut-ul wancenhi mwul-lo chaywuta.
   ‘Minsu completely filled a bowl with water.’

The interpretation for (5a) is that Minsu filled the bowl with water from a bottle until the bottle was empty. In (5b), Minsu filled the bowl until the bowl was fully filled. The results of my preliminary study (Joo, 2000) also suggested that the linking rules apply to Korean and that the holism effect exists in Korean but weakly.

The Korean word for *fill* (‘chaywuta’) belongs to the alternating class, as shown in (5). As Pinker (1989) points out, the assignment of verbs to narrow-range conflation classes seems to be language specific. Some Korean locative verbs show the same syntactic behaviour as their English counterparts, some are syntactically more liberal and some are syntactically more restricted (Kim et al., 1999). Kim (1999) investigated the cross-linguistic diversity of syntax–semantics correspondences in locative verbs and claims that Korean does not have ground-oriented non-alternating verbs such as English *fill* but does have figure-oriented non-alternating and figure/ground-oriented alternating verbs. However, in my preliminary study (2000) based on Lee’s (1997) study and a Korean corpus developed by KAIST University in Seoul, Korea (2000), I found a few ground-oriented non-alternating verbs,\(^3\) such as *telephita* (‘dirty’), *makta* (‘plug’), *mewuta*\(^4\) (‘plug’), *kkumita* (‘decorate’). Most locative verbs are figure-oriented non-alternating

\(^3\)Interestingly, two ground-oriented non-alternating verbs, *telephita* (‘dirty’) and *mewuta* (‘plug’), have overt causative morphemes *-hi* and *-wu*, respectively, which is predicted by Juffs (1996a; 1996b). Juffs (1996a; 1996b) suggests that languages like Chinese do not allow a root morpheme to conflate the pattern \[\text{ACT(+effect)} \rightarrow \text{GO [STATE]}\], so that a \text{STATE} morpheme is added to create a grammatical ground-object frame.

\(^4\)Mewuta (‘plug’) is classified as an alternating verb in Kim (1999). However, the verb can take a figure-object frame when a light verb *nuhta* (‘put’) is added at the end. The verb itself is a ground-oriented non-alternating verb. The KAIST corpus (2000) also presents the verb in ground-object frames.
and figure/ground-oriented alternating verbs in Korean, so linguists may regard the few ground-oriented non-alternating verbs as exceptions. In addition, one of the interesting findings is that the number of ground verbs is much smaller than that of figure verbs among Korean locative verbs, whereas English has more ground verbs than figure verbs. In sum, Korean and English locative constructions are similar in terms of broad-range rules and conflation classes but dissimilar in terms of narrow-range rules and conflation classes.

This article investigates the acquisition of English locative constructions by native speakers of Korean within the framework of Pinker’s learnability theory. The experiments in this article test 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 rules and broad conflation classes – and, secondly, specific constraints on the classes of verbs that can occur in a construction (related to Pinker’s narrow-range rules and narrow conflation classes). Korean learners of English were chosen as the participants for this study, since Korean has different narrow conflation classes for locative verbs from English. Locative alternations were chosen as the main constructions because Korean learners typically have little instruction on them. It was reasoned that with locative alternations, the possibility that negative evidence is provided by instruction could be excluded. L2 learners would thus have a learning condition similar to L1 children in terms of negative evidence with one difference, the presence of the L1. Reasonable questions to ask then would be whether L2 learners overgeneralize argument structures of locative verbs (productivity), whether they retreat from the overgeneralized argument structures to the correct argument structures like L1 children, and how their L1 influences their acquisition of argument structures in the L2. The following sections describe the experiments on the acquisition and interpretation of English locative constructions by advanced learners of English whose native language is Korean.

5Some ground-oriented non-alternating verbs are taught as fixed phrases in secondary English classes in Korea. For example, ‘fill A with B’ and ‘cover A with B’. And unlike dative alternations, locative alternations are not taught in terms of grammaticality nor interpretation.
II Research questions

The purpose of the experiments is to investigate to what extent advanced Korean L2 learners of English acquire knowledge of the English locative alternation, which overlaps with but is not identical to the alternation in their native language. Research questions for the study were the following:

- Do L2 learners develop native-like knowledge of English locative alternations? Can they identify the semantic constraints imposed by the broad conflation classes, viz. the holism effect?
- Do they acquire the semantic constraints imposed by narrow conflation classes, language particular properties?
- Does the L2 learners’ L1 influence the acquisition of English locative alternations?

III The study

1 Participants

There were two groups of participants: 17 English native speakers and 59 Korean learners of English. The Korean learners of English were all college students in Seoul, Korea, whose TOEFL scores ranged from 550 to 650. They had all learned English as a foreign language for at least six years, mostly in a public educational setting, where the focus was primarily on reading and listening. They are what are often called ‘high-level’ learners in second language studies. They would be qualified to study at many American universities. There was also a comparison group of English native speakers (US college students).

2 Materials and procedures

The experiment contained two tests: a forced-choice picture description task and a forced-choice sentence selection task. Each group of participants took both tests in English. The English native speakers who took the English locative tests were included to demonstrate the validity and reliability of the tests. The experiment included 12 English locative verbs: 2 verbs from each of the 6

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The participants were advanced in terms of grammar, vocabulary and reading skills. Their listening, speaking, and writing skills were also good, since their major was TEFL (Teaching English as a foreign language). They had taken intensive English classes but not formal linguistics courses yet. In the pilot tests for these experiments, Korean speaking advanced learners of English who had attended a graduate school in the USA for more than one year participated. The results of the pilot showed tendencies very similar to the ones found in the current experiments.
narrow conflation classes (2 figure class, 2 ground class, 1 figure-oriented alternating class and 1 ground-oriented alternating class).\(^7\)

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

The number of items was 24 for each test, because each verb was presented twice in two contexts (partly affected ground vs. completely affected ground) or in two sentences (figure-object frame vs. ground-object frame). In Test 1, the experimental task presented an English sentence – either a figure-object sentence or a ground-object sentence – and two story strips illustrating an event (see Figure 1). In one of these illustrations, the ground argument was presented as wholly affected (ground picture). In the other picture, the ground argument was presented as not being wholly affected (figure picture). Participants were supposed to choose which picture went best with the sentence. They were to mark ‘neither’ for sentences that were not possible in either situation.

Test 1 could be said to be a mixture of a grammaticality judgement and a meaning preference test. In Test 2, two sentences were provided with a given context: one picture at a time (see Figure 2). Participants were supposed to choose the sentence which best described the given context or choose ‘neither’.

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\(^7\)The verbs included in these experiments are the ones that Korean learners learn in middle or high school. The participants were advanced enough to know all the verbs. After the experiments, the participants did not complain about the difficulty of the verbs themselves.
IV Results

1 Test 1

Since the results of Test 1 have been reported in Bley-Vroman and Joo (2001), I first briefly summarize the general findings and then re-examine them by verb class (for details, see Joo, 2000; Bley-Vroman and Joo, 2001). The dependent variable is the number of ground-picture choices for verbs of a particular narrow class, which is referred to as ‘the degree of groundness’ in this experiment. If a participant chose a ground-picture, he or she scored 1 point. If the participant chose a figure-picture or ‘neither’ of the pictures, he or she scored zero points. A two-way ANOVA with repeated-measures was performed separately for each group, the English native speakers and the learners. In the results from the native speakers of English, the main effects for sentence type and for verb class were statistically significant in the analysis of variance (F = 37.60 \( p < .0125 \) and F = 66.120 \( p < .0125 \), respectively). However, the results of the Korean EFL learners showed only the variable sentence type having a significant main effect (F = 32.495 \( p < .0125 \)). The significant main effect for sentence type, in both groups, reflects the fact that they chose ground pictures more often when given a ground-frame sentence. This seems to be a reflection of the holism effect: they have knowledge of the constructional meaning of the locative. Figures 3 and 4 show that both groups chose more ground pictures when ground sentences were presented except for the figure verbs in the native speakers’ graph, which is because the native speakers chose ‘neither’ of the pictures when given the ground sentence of figure verbs (e.g., John poured the glass with water). The significant interaction effect in both ANOVAs indicates that the effect of verb class is dependent on the choice of sentence type, but not as a consistent effect for class across structures. \( \eta^2 \) was estimated in order to test the degree of association between the variables (Hatch and Lazaraton, 1991: 355). The \( \eta^2 \) of interaction in the native speakers’ data was .57, which shows that 57% of the variability in the test is accounted for by the class X sentence type interaction. However, in the Korean learners’ data, the sentence type factor alone accounts for most of the variability (89%). This is a very strong relationship.

The effect for verb class in the English native-speaking group reflects their knowledge of the narrow-class constraints. As seen in the graph of English speakers in Figure 3, the means of the figure

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8The experiment-wide alpha decision level was set at .05 applying the Bonferroni correction. However, it was divided by 4, the number of ANOVAs in the whole study (Test 1 and Test 2 for each language group), and therefore .0125 is the alpha decision level for each ANOVA.
class are low in the ground sentence (0.59 out of 4) because the ground frame of the figure class (e.g., *John poured the glass with water*) is ungrammatical. Also, the means of the ground class are low in the figure sentence (0.53 out of 4) for the same reason. But the means of the alternating class (1.94 out of 4) are higher than

Notes: *Figure-object sentence: ‘John loaded hay onto the truck.’ Ground-object sentence: ‘John loaded the truck with hay.’

**Figure 3** Test 1 (Forced-choice picture selection task): native speakers of English

Notes: *Figure-object sentence: ‘John loaded hay onto the truck.’ Ground-object sentence: ‘John loaded the truck with hay.’

**Figure 4** Test 1 (Forced-choice picture selection task): Korean learners of English
those of other classes, since alternating verbs allow both sentences. In this case, it is not a grammar problem but a preference tendency. However, in the graph of the learners (Figure 4), the means of the figure class in the ground sentence or the means of the ground class in the figure sentence are similar to those of the other classes, which means they do not reject ungrammatical sentences. As shown in Figure 4, there is no effect for verb class: in the learner data, the patterns of the three classes are not different from each other. This can be interpreted as the learners not having achieved native-speaker knowledge of the narrow classes. Only the means of the alternating class in the two constructions are similar in both groups. Figure 5 presents the responses for ground verbs in an ungrammatical frame. Most of the English ground verbs used in this experiment belong to the alternating class in Korean (e.g., fill, cover and decorate), so the Korean learners had to narrow down their grammar from a superset to a subset, which is expected to be difficult. As expected, the learners had difficulty in rejecting the ungrammatical sentences (7%), which were rejected by the native speakers (93%). The more interesting results are found in the responses for figure verbs in a ground frame, which are ungrammatical (Figure 5). Most figure verbs included in this study are also figure verbs in the learners’ native language (e.g., pour, spill and nail), so the learners are predicted to have little difficulty.

Notes: NS: native speakers of English; L2: Korean learners of English

Figure 5  Test 1 (Forced-choice picture selection task): responses to ungrammatical figure sentences with ground verbs (e.g. “John filled water into the glass”) and ground sentences with figure verbs (e.g. ‘John poured the glass with water’)

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However, the learners did not reject the ungrammatical sentences of the figure verbs, which are also ungrammatical in their L1.

2 Test 2

Since Test 2 presented pictures of the two contexts (figure picture and ground picture) as test items, the dependent variable is the frequency of ground-sentence responses, which is referred to as the ‘degree of groundness’ in this experiment. If a participant chose a ground-construction, he or she scored 1 point. If the participant chose a figure-picture or ‘neither’ of the constructions, he or she scored zero points. Factors are:

- type of picture: ground or figure; and
- narrow semantic verb class: alternating verbs, ground verbs and figure verbs.

A two-way ANOVA with repeated-measures was performed separately for each group to measure the variance of groundness at the alpha level of .0125. The null hypothesis is that each picture will be matched with a ground picture with equal frequency.

The results of both groups show statistically significant differences in the F values of each factor and the interaction of factors (Table 1 and Table 2). In other words, the participants in both groups responded differently depending on the given picture and verb class. The results of Test 2 are different from those of Test 1 in which the EFL learners showed no statistically significant difference for verb class factors. This indicates that the characteristics of the test have changed by presenting pictures as stimuli in Test 2, instead of as options like in Test 1.

As a whole, the participants of both groups prefer ground-object sentences when given ground pictures and figure-object sentences when given figure pictures. They tend to express a ground argument as the object of the sentence when the ground argument is fully affected. In the results of Test 2, there also seems to be a reflection of the holism effect. An interesting point is that the results of the EFL learners also showed a significant effect for verb class in Test 2. This might lead to the interpretation that the EFL learners behaved similarly to the English native speakers, which may mean that the EFL learners also have knowledge of narrow-class constraints. However, great care should be taken in this interpretation. First, as shown in Table 1, the eta² value of class in the native speakers’ data is .60, which shows that 60% of the variability in the test has been accounted for by class factors. In the Korean learners’ data (Table 2), the picture factor alone accounted
for most of the variability (94%). The strongest factors for each group differ from each other. Figures 6 and 7 show the difference in the patterns of both groups more clearly.

First, the results show that Test 2 was a kind of grammaticality judgement test for ground and figure verbs. In the graph of the native English group (Figure 6), the means of groundness in the

![Graph](image)

**Note:** Figure-oriented pictures describe partitive effects whereas ground-oriented pictures convey holistic effects

**Figure 6 Test 2: Native speakers of English**

Table 1  ANOVA for native speakers of English (Test 2)

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<td>Total</td>
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<td>233.961</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* *p < .0125

Table 2  ANOVA for Korean learners of English (Test 2)

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>2</td>
<td>10.988</td>
<td>5.494</td>
<td>13.981*</td>
<td>.02</td>
</tr>
<tr>
<td>Picture</td>
<td>1</td>
<td>447.020</td>
<td>447.020</td>
<td>106.912*</td>
<td>.94</td>
</tr>
<tr>
<td>CXP</td>
<td>2</td>
<td>18.251</td>
<td>9.126</td>
<td>13.090*</td>
<td>.04</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>476.259</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* *p < .0125
Figure class are very low, almost reaching zero (0.41). Ground-object frames of the figure class are ungrammatical regardless of context type, so the native English group rejected all the ground-object frames of the figure class verbs. And, the means of groundness in the ground class (3.88) are high compared to those of other classes (0.41 and 3.24), since ground-object constructions of the ground class are always acceptable regardless of context type. The means of groundness in ground contexts (given ground pictures) are higher than in figure contexts (given figure pictures), which means ground-object constructions are preferred in expressing the situation in which the ground is fully affected. In the case of the alternating class, this test simply tested the participants’ preference. For verbs of this class, native speakers chose figure-constructions when given figure pictures, and ground-constructions when given ground pictures.

However, in the graphs of the EFL learners (Figure 7), the patterns of all three verb classes are similar: low in figure contexts and high in ground contexts. The EFL learners still chose figure-object structures given figure pictures and ground-object structures given ground pictures, which reflects a knowledge of the broad-range constraint of English locatives. They did not reject ungrammatical sentences, which means they still have little knowledge of narrow class constraints. As reported before, there are also significant effects for verb class in the group of EFL learners. That is because the means of each class are different from

Note: Figure-oriented pictures describe partitive effects whereas ground-oriented pictures convey holistic effects

Figure 7 Test 2: Korean learners of English
each other. The ascending order of the means is: figure class (2.47),
alternating class (3.05) and ground class (3.47), and it is the same
as that of English native speakers’. In this respect, EFL learners
show behaviour similar to that of English native speakers.

In order to see the effects of L1 transfer, two types of verb groups
should be compared directly. The first verb groups are the fill-type
(e.g., fill and cover) and decorate-type (e.g., pollute and decorate)
verb, which are ground verb classes in English but an alternating
verb class in Korean. As mentioned in Test 1, the L2 learners are
expected to have trouble in acquiring the verbs in these groups,
because they are acceptable in ground sentences in their native
language but not in English (except for pollute which is a ground
verb both in Korean and in English). Given ground pictures where
the ground is fully affected, both the native speakers and the
learners behaved similarly. However, when figure pictures were
presented with a partly affected ground, the native speakers
selected ground frames or rejected both sentences whereas the
learners mostly selected figure frames. It is interesting that the
native speakers disliked using the ground verbs, especially fill
(43%) and cover (71%), when the ground was not fully affected.
The holistic meaning seems to influence those verbs’ meanings
because they only allow ground object frames. The L2 learners
chose figure frames, which are ungrammatical in English but
grammatical in Korean. This may be due to L1 transfer effects.
However, as in Test 1, the L2 learners also behaved differently with
the verbs pour, spill and nail, which are figure verbs both in English
and in Korean. The native speakers chose figure frames (100%)
even when ground pictures were presented for the verbs, because
figure verbs only allow figure sentences. However, when ground
pictures were presented for the figure verbs, the learners chose
either figure frames (41%) or ground frames (56%) at similar rates.
In other words, the learners accepted ground frames for verbs which
are not acceptable in their native language.

V Discussion

1 Do Korean speakers acquire semantic constraints imposed by
broad conflation classes in L2 English: the holism effect?

The answer to the first research question is ‘yes’. Both experiments
showed that second/foreign language learners had knowledge of the
broad-range semantic constraints imposed by English locative
verbs. It is not clear whether that knowledge has been transferred
from the learners’ L1 or is given innately in their language system,
because Korean seems to have similar broad constraints similar to those found in English, even though the holistic interpretation in Korean locatives is not as strong as that in English locatives. However, the Korean learners showed that they have knowledge of the holism effect in English quite strongly.

Schwartz *et al.* (2003), following Rappaport and Levin (1985), suggest that the holism effect is just ‘a pragmatic effect that supervenes on a grammatical representation’. Rappaport and Levin (1985) suggest that the holism effect is actually an epiphenomenon of the fact that the verb specifies a change of state. As Schwartz *et al.* argue, the holistic interpretation can be context dependent. For example, one can say *The vandal sprayed the statue with paint* when only a dab of paint is involved, since even a single blemish can ruin the beauty of the statue. However, when it applies to ordinary grounds or containers, the holism requirement is a state-change requirement, since the change of state cannot be judged unless the containers are entirely covered or filled (Pinker, 1989: 78). If only a single situation is presented with one kind of locative verb frame, the holistic interpretation may depend on context. However, in this study, the grounds were presented in two conditions, partly affected and fully affected, for direct comparison, which helps avoid a context-dependent interpretation. Another concern about the holism effect suggested by an anonymous reviewer is that it may be intensified by a telicity interpretation, which was realized by the boundedness of the grounds or locations in the experiments. In this respect, I agree with the reviewer. For this reason, only definite articles were used with the ground in the experiments.

2 Do Korean speakers acquire the semantic constraints imposed by narrow conflation classes in English: language-particular properties?

In the results of the experiments, the Korean learners of English showed little knowledge of the narrow-range semantic constraints of English locative verbs. The learners did not distinguish which group the verbs belonged to – figure, ground or alternating class – as shown by the fact that they did not reject ungrammatical sentences such as *John poured the glass with water* or *John filled water into the glass*. This was not the result of L1 transfer, since the learners consistently made their judgements regardless of the verbs’ class in English or in Korean; they matched figure-object constructions with pictures with figure interpretations and ground-object constructions with pictures with ground interpretations.
3 Does the L2 learners’ L1 influence the acquisition of English locative alternations?

As mentioned before, in the case of the broad-range constraints, it is not clear whether the L1 influenced L2 acquisition. However, in the case of narrow-range constraints, L1 transfer effects were not shown. The L2 learners had difficulty with both groups of English locative verbs, one which shows the same property as Korean and the other which shows a narrower range of possibilities than Korean. If they had transferred L1 settings, they would have had little problem with the *pour*-type verbs that are the same in both languages. Juffs (1996b: 188) reasoned that this knowledge is constrained by principles active in L1 acquisition when adults show knowledge of properties of the L2 lexicon that is derivable neither from the L1 nor from L2 input. According to Juffs’ reasoning, it can be argued that Korean learners of English have acquired locative constructions of the second language with the same language system as L1 learners, within Pinker’s theory, informed by semantic constraints and linking rules. But they had not achieved native-like knowledge yet.

4 What makes L2 learning difficult?

Considering the L2 learners’ significant differences between the three locative classes in the results from Test 2, they seem to be in the middle of the development process. Even though the learners were advanced students whose TOEFL scores ranged from 550 to 650, they had not developed native-like knowledge of locative alternations. The reason may be a lack of positive input or a lack of negative input. The number of English locative verbs is over 145 (Rappaport and Levin, 1985), but most locative verbs are infrequent, so the L2 learners may not have had enough input featuring less frequent locative verbs, especially in an EFL setting. On the basis of a corpus-based analysis of the frequency of verbs and their syntactic requirements in an ESL textbook, Juffs (1998) also suggests that ESL materials seem to provide insufficient input on verbs and their syntactic behaviours and under-represent some of the verb classes that are known to cause learners difficulty. Nobody would doubt that language acquisition is influenced by the amount of positive input. The other reason may be lack of negative input. Learners did not reject ungrammatical sentences: ground-object constructions for figure class verbs and figure-object constructions for ground class verbs. They overgeneralized argument structures of English locatives and could not retreat from
overgeneralization. L2 learners are rarely instructed on the argument structures of locatives. Pinker (1989: 292) suggests a simple answer to the unlearning problem in first language acquisition: ‘Children’s overgeneralization errors are due either to the application of broad-range lexical rules or to systematic misconceptions about the meanings of particular verbs.’ Gropen (1989: 199) also supported Pinker, arguing that the syntactic overgeneralization of locatives results from misinterpretations of particular lexical items in conjunction with the universal linking rule. L2 learners’ overgeneralization errors seem to be due to the same reasons as in the L1.

The next question is why L2 learners do not retreat from overgeneralization even though children do without negative evidence. There may be something problematic in the L2 learners’ way of learning lexical meaning. In order to account for the learning of lexical semantic structures, Pinker (1989) suggests three mechanisms:

- event-category labelling, ‘linking verb meanings onto the mental representation of concepts’)
- semantic structure hypothesis testing, ‘adjusting any incorrect hypothesis by observing how the verb is used across situations’; and
- syntactic cueing of semantic structures, ‘learning verb meanings from argument structures’.

Children may use all three mechanisms appropriately. However, L2 learners do not have as many chances to adjust incorrect lexical semantic structures – semantic structure hypothesis testing – as do children. EFL learners have fewer opportunities to observe the use of the verb’s argument structure in real life interactive communication. Instead, they must rely on discourse context in reading or listening passages to learn lexical semantic structures. EFL learners may depend more on the third mechanism, syntactic cueing of semantic structure. It is easier for them to learn verb meanings from argument structures presented in example sentences in context or in a dictionary. As shown in the results of Test 2, the means by class were significantly different, which means learners could distinguish the different syntactic behaviour of each verb class to some degree. They seem to begin with acquisition of syntactic argument structures rather than semantic structures. Therefore, it may be argued that L2 learners’ insufficient knowledge of lexical argument structures results from partial use of the learning mechanism.
VI Summary

This article has investigated the acquisition of the locative alternation by adult Korean learners of English in the framework of Pinker’s learnability approach. The learnability issue is how first language learners succeed in the acquisition of argument structures without negative evidence. Pinker’s conception of broad/narrow-range constraints was employed as the best approach in uncovering semantic constraints and the learning paradox posed by the locative alternation.

The first finding reported showed that second/foreign language learners had acquired the broad-range range constraint, the ‘holism effect’ of English locative constructions. However, whether such knowledge comes from the L1 or from an innate language system is unclear, since Korean also seems to have the constructional meanings associated with locative constructions, by hypothesis due to universal linking rules, even though the effect is weak. Secondly, the L2 speakers had little knowledge of language particular properties, i.e., narrow-range rules and narrow conflation classes of locative verbs. They also had difficulty with English locative verb classes that have the same properties as equivalent verbs in Korean. Their knowledge of locative alternations was neither the same as the target language, English, nor their L1, Korean. The reason for L2 learners’ impaired learning seems to be insufficient use of ‘semantic structure hypothesis testing’, a mechanism for learning verb meanings from argument structures. It should be noted that this study neither claims that L2 learners cannot achieve a native-like knowledge, nor that their L1 is not involved even in the initial stages of L2 development.

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VII References


Kim, M. 1999: A cross-linguistic perspective on the acquisition of locative
verbs. Unpublished PhD dissertation, University of Delaware, Newark, DE.


