Young EFL students' reliance on path-breaking verbs in the use of English argument structure constructions

Hyunwoo Kim[1], Haerim Hwang[2], Yangon Rah[3]

University of Hawaii at Manoa
Republic of Korea Air Force Academy[3]
hyunwoo2@hawaii.edu

This study investigates the extent to which young EFL students rely on path-breaking verbs in the comprehension and production of English argument structure constructions. In a sentence-sorting task, Korean EFL learners in grades 7 and 10 sorted English sentences, which were created by crossing four verbs with four constructions, into same groups according to overall sentence meaning and form. The results showed dominant verb-oriented sorting in grade 7, and more construction-biased sorting in grade 10 when the sentence included a path-breaking verb. In a written production task, Korean EFL students from grades 4 to 7 wrote a book report in English after a 4-week extensive reading program. The results demonstrated the more dominant use of path-breaking verbs in the ditransitive and resultative constructions than in the caused-motion construction. We discuss these findings in terms of usage-based perspectives of constructional learning.

Keywords: *Path-breaking verb, argument structure construction, usage-based learning, young EFL student*

1. Introduction

Constructionist perspectives (e.g., Bates & MacWhinney, 1987; Ellis, 2008; Goldberg, 1995, 2006; Langacker, 2000; Tomasello, 2003) explain language learning and development in terms of generalization of linguistic

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patterns that a learner derives from utterances in daily communication. According to this approach, a child gradually formulates and schematizes abstract constructional representations in the course of statistical learning of repetitive patterns from exemplars he or she encounters through social interactions (Bybee, 2008; Goldberg, 2006; Tomasello, 2003). This process of schematization of constructions is driven by frequency of input (Abbot-Smith & Tomasello, 2006; Ellis & Ferreira-Junior, 2009). Building on cumulative experiences with high-frequency exemplars in language input, a child establishes an inventory of constructional types, or symbolic and conventionalized form-meaning pairings, in their mind (Bybee, 2008; Dodson & Tomasello, 1998; Ellis, 2002; Theakston, Lieven, Pine & Rowland, 2001; Tomasello & Brooks, 1999).

One of the bootstrapping mechanisms in this frequency-based learning process is*path-breaking verbs* or high-frequency verbs containing semantically light contents that have general meanings and purposes, such as *want, do, make, put, take, give,* and *get* (Ninio, 1999). Path-breaking verbs denote actions associated with basic human experiences in daily life (Ellis, 2002; Goldberg, 1995) as well as conveying general semantic information that can integrate with individual constructions (Goldberg, 2013). By virtue of their characteristics of high frequency, prototypicality, and semantic lightness, path-breaking verbs are assumed to help children to internalize formulaic patterns of sentence configurations from individual instances (Goldberg, Casenhiser & Sethuraman, 2004; MacWhinney, 2008; Ninio, 1999; Tomasello, 1992, 2003). For example, as children are exposed to numerous tokens of sentences where a number of path-breaking verbs consistently occur in certain constructions (e.g., give in the ditransitive construction), tight associations are formed between the verbs and the constructions as pairings in their mind, helping the children develop abstract knowledge of constructions (Ellis, 2002).

Relative to the extensive documentation on the facilitative role of path-breaking verbs in first language (L1) development, less is known about how young second language (L2) learners utilize path-breaking verbs in the course of their constructional development (see Ellis & Larsen-Freeman, 2009, for adult L2 learners' use of path-breaking verbs). Several studies have investigated the L2 acquisition of English constructions (e.g., Authors, xxxx, Gries & Wulff, 2005; Manzanares & López, 2008), yet almost exclusively with adult learners who are deemed to have passed the inchoative stages of constructional development. Considering the central role of path-breaking verbs in the early formulation of constructional representations in L1 acquisition (e.g., Ninio, 1999), a question may arise as to whether path-breaking verbs work in the same way in an early L2 acquisition.

To address this question, we conducted sentence-sorting and written production tasks with young students learning English as a foreign language (EFL) in Korea, investigating their use of path-breaking verbs in the comprehension and production of English argument structure constructions. Given the contribution of path-breaking verbs in L1 constructional development, we predict that young EFL learners will show strong reliance on path-breaking verbs in their use of English constructions. As we are not aware of any research that draws attention to young L2 learners' usage pattern of path-breaking verbs both in comprehension and production, results obtained from our study are expected to provide a clearer picture on how L2 learners begin to develop constructional representations with the help of path-breaking verbs in the early learning stages, shedding light on pedagogical applicability of path-breaking verbs in the EFL setting.

2. Path-breaking verbs and constructional development

The constructional approaches to language learning (Bates & MacWhinney, 1987; Croft, 2001; Ellis, 2013; Goldberg, 1995, 2006) maintain that children develop an inventory of constructions (see Table 1 for examples of English argument structure constructions). A construction is a symbolic unit that has a form and meaning on its own right, independent of individual linguistic items that form the construction (Bencini & Goldberg, 2000; Goldberg, 1995, 2006). For example, the ditransitive construction can accommodate a variety of verbs, such as "Tom kicked John the ball," "Tom rolled John the ball," and "Tom sold John the ball," all of which deliver the same basic meaning of "X causes Y to receive Z,". The fact that the semantic diversity of the verbs does not change the constructional meaning indicates that a construction can contribute to an overall sentence meaning irrespective of

verbs (Bencini & Goldberg, 2000; Goldberg, 1995, 2006). Such knowledge of constructions is assumed to be internalized as abstract and schematic information in the language learner's mind (Bybee, 2008; Ellis, 2008; Goldberg et al., 2004), enabling a learner to integrate newly acquired verbs into the established constructions (Goldberg, 1995, 2006).

Table 1. Examples of English argument structure constructions

Construction	Form	Meaning
Intransitive-unergative	Subj V	X acts
Intransitive-motion	Subj V $Obl_{path/loc}$	X moves $Y_{path/loc}$
Intransitive-resultative	Subj V COMP	X becomes Y_{state}
Transitive	Subj V Obj	X acts on Y
Caused- motion	Subj V Obj $_{Oblpath/loc}$	X causes Y to move $Z_{path/loc}$
Ditransitive	Subj V Obj Obj2	X causes Y to receive Z
Resultative	Subj V Obj RP	X causes Y to become Z_{state}

Researchers note that the early development of constructional knowledge is mediated by verbs that appear most frequently in a construction (Dodson & Tomasello, 1998; Goldberg, 1995; Ninio, 1999; Tomasello, 2003). For example, linguistic information that a child receives from his or her caregiver mostly includes high-frequency constructions with prototypical meanings, such as the intransitive, transitive and ditransitive constructions (Cameron-Faulkner, Lieven & Tomasello, 2003; Farrar, 1992; Theakston et al., 2001). These constructions are often expressed by high-frequency verbs that contain prototypical meanings (e.g., go for the intransitive-motion, *put* for the caused-motion, *give* for the ditransitive, and *make* for the resultative construction). These so-called path-breaking verbs (Ninio, 1999) help children advance from acquiring specific verb-construction instances to formulating more abstract representations of constructions.

Two properties of path-breaking verbs are known to promote constructional learning – frequency and prototypicality. Firstly, highly frequent path-breaking verbs such as *get* and *take* appear across various constructions (Campbell & Tomasello, 2001; Ellis & Ferreira–Junior, 2009; Goldberg et al., 2004). With these verbs, a child produces basic-level constructions on a verb-by-verb basis, which is characterized as a verb-centered acquisition of constructions (Dodson & Tomasello, 1998; Goldberg, 1995; Goldberg et al., 2004; Ninio, 1999; Tomasello, 2003). As a child is constantly exposed to numerous tokens where path-breaking verbs are associated with particular constructions, they gradually acquire abstract knowledge of the constructions through the cognitive process of abstraction, analogy, pattern finding, and generalization (Akhtar, 1999; Akhtar & Tomasello, 1997; Bates & MacWhinney, 1987; Ninio, 1999; Pinker, 1989; Tomasello, 1992). As a consequence, a verb-centered acquisition advances into developing abstract constructional knowledge.

Another crucial role of path-breaking verbs in the development of constructional knowledge is that they encode prototypical meanings that are closely aligned with basic sentence types related to common human experience, such as "someone causing something, something moving, something being in a state, someone possessing something, something causing a change of state or location, something undergoing a change of state or location, and something having an effect on someone." (Goldberg, 1995, p. 39). Such prototypical senses carried by path-breaking verbs are tied to constructional meanings, providing a child with an easy access to form-meaning correspondences of constructions through semantic bootstrapping (Casenhiser & Goldberg, 2005; Ellis & Ferreira-Junior, 2009; Goldberg et al., 2004; Ninio, 1999).

3. Previous research on the role of path-breaking verbs

Numerous studies have reported a facilitative role of path-breaking verbs in child's early constructional development (Goldberg, 2006; Goldberg et al., 2004; Ninio, 1999). For example, Ninio (1999) observed that English- and Hebrew-speaking children (recorded roughly between the ages of 1 and 2) dominantly used path-breaking verbs, such as *do, make, take, give*, and *get*, in their production of subject-verb and subject-verb-object constructions. Their strong reliance on these prototypical verbs continued until the children further developed constructional knowledge and began to use other types of verbs in these constructions. Similarly, Gropen and colleagues (Gropen, Pinker, Hollander, Goldberg & Wilson, 1989) collected ditransitive

utterances from five children (Adam recorded between the ages of 2;3 and 5;2; Eve: 1;6–2;3; Sarah: 2;3–5;1; Ross: 2;7–6;6; Mark: 1;5–4;7) and found that four of the five children used *give*more than twice than the other verbs for the target construction.

Research further demonstrated that children use path-breaking verbs whose meaning is highly related to that of the constructions in which they appear. In a corpus analysis of mother talk and children's speech in English, Goldberg and her colleagues (Goldberg et al., 2004) found that the meaning of the most frequent path-breaking verbs in the speech of children and their mothers overlapped with the meaning of the corresponding constructions they produced, indicating that the semantic relationship between path-breaking verbs and corresponding constructions plays a crucial role in the formulation and development of constructional knowledge in the early language learning stages (but see Campbell & Tomasello, 2001, who found no support for child's reliance of path-breaking verbs in the production of dative constructions).

It is also reported that adult L2 learners actively use path-breaking verbs in the production and comprehension of English constructions (e.g., Authors, xxxx; Ellis & Ferreira-Junior, 2009; Ellis & Larsen-Freeman, 2009). In L2 comprehension, Authors (xxxx) found that adult L2 learners at intermediate proficiency level demonstrated increased sensitivity to constructional meaning in the presence of path-breaking verbs. In a sentence-sorting task, intermediate- and advanced-level learners sorted 16 English sentences into four groups based on overall sentence meaning. Half of the learners at each proficiency level read sentences containing semantically light verbs (*get, take*) and nonce or non-existing verbs, and the other half read sentences with semantically heavy verbs (*drop, cut, throw, kick*). Their results showed that the intermediate-level learners produced construction-oriented sorting only with the path-breaking and nonce verbs, whereas the advanced learners produced constructional sorting regardless of verb type. From these findings, the researchers concluded that the path-breaking verbs helped increase the intermediate-level learners' facility of constructional meaning in the course of sentence comprehension.

In L2 production, Ellis and Ferreira-Junior (2009) analyzed spoken data from adult ESL learners, and found that the learners focused on a particular verb in the production of each target construction: *go* was used 53% for VL (Verb-Locative; intransitive-motion construction); *put* was used 68% for VOL (Verb-Object-Locative; caused-motion construction); give was used 64% for VOO (Verb-Object-Object; ditransitive construction). In addition, the frequency of these verbs was strongly associated with that of each construction type, suggesting that the dominant use of path-breaking verbs in production stems from their high frequency and compatibility with target constructions.

Despite extensive evidence for a strong reliance on path-breaking verbs in young L1 and adult L2 speakers, it remains less well understood how young EFL learners use path-breaking verbs when they begin to build basic constructional knowledge. Although previous studies reported that L1 children and adult L2 learners actively use path-breaking verbs in comprehension and production, there is little evidence whether the same tendency is observed for young EFL learners. Given the limited language resources and time constraints in the EFL setting, a result showing that path-breaking verbs help young EFL learners in early constructional development may point to an important role of these verbs in the early phases of English learning. Such a result may also offer productive directions for utilizing path-breaking verbs in EFL classrooms.

4. Present study

The main goal of this study is to examine use patterns of path-breaking verbs by young Korean EFL learners in comprehension and production. To this aim, we address the following research questions:

1. Do young Korean EFL learners show increased sensitivity to constructional
   meaning with path-breaking verbs (Experiment 1)?

2. How do they rely on path-breaking verbs in their production of English argument
   structure constructions (Experiment 2)?

5. Experiment 1: Sentence sorting

A sentence-sorting task was conducted to test whether path-breaking verbs help young EFL learners use constructional information in sentence comprehension. A total of 16 English sentences were presented in four English constructions crossed with two path-breaking verbs and two semantically heavy verbs, and participants sorted the sentences into four groups according to their overall meaning and form (cf. Bencini & Goldberg, 2000).

The purpose of the task was to probe how strongly the students rely on path-breaking verbs in clustering the sentences. We predict that young EFL learners' facility of constructional information as reflected in their sorting will be affected by learners' proficiency. Specifically, beginner-level learners will demonstrate a strong verb-oriented sorting pattern, whereas intermediate-level learners will be more likely to sort the sentences according to constructions. Crucially, if path-breaking verbs help to draw learner's attention to constructional meaning, stronger construction-oriented sorting is expected when the sentences include path-breaking verbs. The sentences containing semantically heavy verbs, on the other hand, will hardly be clustered around the same constructions.

5.1 Participants

The sentence-sorting experiment involved 82 young Korean-speaking EFL learners, including 41 secondary school students in grade 7 (G7), and 41 high school students in grade 10 (G10). Results from a language background survey revealed that none of these learners had any experience of staying in English-speaking countries at the time of testing, indicating that they had studied English as a foreign language in Korea. Our selection of participants in these particular grades allows us to capture an early process of constructional learning for these learners since the target constructions investigated in this study (i.e., caused-motion, ditransitive, and resultative constructions) begin to be taught in grade 6 in Korea (Ministry of Education, 2015). It is thus assumed that the students in G7 were in the very initial stage of constructional learning, while the learners in G10 had some experiences with the target constructions.

To ascertain that the two groups were distinguished in their general English proficiency, an English C-test (Keijzer, 2007) was administered before the main experiment. An independent samples t-test on the mean scores revealed a significant group difference, $t(80) = 4.360$, $p < .001$, $d = .97$, indicating that G10 was more proficient than G7. Table 2 summarizes the information of each group including the sample size, years of studying English, mean age and the results of the C-test.

Table 2. Learner group information.

Group	*n*	Mean length of learning English year	Mean age	C-test score max=40	
				Mean	SD
G7 (7th grade)	41	2;3	12;3	6.3	3.56
G10 (10th grade)	41	4;7	15;6	11.1	6.01

5.2 Materials

Sixteen English sentences were obtained by crossing four lexical verbs with four types of constructions (transitives, ditransitives, caused-motions, and resultatives). For the verbs, two semantically heavy verbs (cut, throw) and two path-breaking verbs (get, take) were adopted from previous sentence-sorting studies (Gries & Wulff, 2005; Valenzuela & Rojo, 2008). All the sentences were presented in the past tense. The entire experimental items are presented in Table 3.

Table 3. List of sentences in the sorting task.

Verb	Construction			
	Transitive	Ditransitive	Caused-motion	Resultative
CUT	Tom cut the bread.	Julie cut Daniel an apple.	Kevin cut the ham onto the plate.	Jim cut the watermelon open.
THROW	Mary threw the ball.	Paul threw Sam a message.	Lee threw the key onto the roof.	John threw the box apart.
GET	Mike got the book.	Sarah got Kim a book.	Tony got the ball into the net.	David got the balloon flat.
TAKE	Amy took the watch.	James took Linda the pencil.	Robert took the flower into the house.	Rachel took the wall down.

5.3 Procedure

The task was completed as a pen-and-paper test. Participants were presented with the 16 sentences on a test sheet and asked to classify them into four groups based on overall meaning and form. At the beginning of the task, they were instructed that each sorting group must contain exactly four sentences. Participants sorted the sentences from Table 3 by writing the sentence numbers in a sorting box on the bottom of the sheet. The overall procedure took approximately 15-20 minutes.

5.4. Coding and analysis

We first counted the number of participants who sorted the sentences entirely by verb or by construction. Then, we calculated deviation scores for verb-based and construction-based sorting for each participant, following the calculation protocol adopted by Bencini and Goldberg (2000). The deviation score for verb-based sorting (Vdev) was obtained by counting the number of changes required for sorting to be entirely verb-based. Likewise, the constructional deviation score (Cdev) was computed as the number of sentences to be changed for entirely construction-based sorting. On a scale of 0 to 12, a lower Vdev/Cdev score indicates stronger verb-/construction-based sorting, whereas a higher Vdev/Cdev score indexes weaker verb-/construction-based sorting.

To grasp a clearer delineation of participants' tendency and examine how verb semantics influenced their sorting, we also performed a hierarchical cluster analysis (e.g. Gries & Wulff, 2005; Valenzuela & Rojo, 2008). A cluster analysis provides visualization of how individual sentences are grouped, allowing us to characterize each cluster of sentences either as verb-centered or construction-centered. Our focus of interest was to examine whether sentences containing path-breaking verbs were more likely to be clustered as a constructional group. For the analysis, a symmetric similarity matrix was obtained by counting how often each sentence was clustered together with the other sentences. A hierarchical cluster analysis was then performed with the similarity matrix using Euclidean distance as a measure and Ward's method as a clustering algorithm.

5.5 Results and discussion

We begin by reporting how often participants classified the sentences entirely by verb or construction. Asymmetric patterns were observed across the two groups: 21 out of 41 learners in G7 produced entirely verb-based sorts (51%), whereas only 5 among 41 in G10 sorted the sentences entirely by verb (12%). These findings support our prediction that more proficient learners are less likely to show verb-oriented sorting. On the other hand, only small number of students produced entirely construction-based sorts in both groups: 6 students in G10 (15%) and 4 in G7 (10%), indicating that both groups had not fully established constructional knowledge.

Figure 1 illustrates mean deviation scores of each group. The students in G7 produced strongly verb-based sorts, as indicated by their low mean Vdev (3.6) and high mean Cdev (9.5). This sorting tendency reflects their strong reliance on verbs as a sorting criterion while showing little evidence for their use of constructional information. On the other hand, G10 showed a mixed sorting tendency, neither dominantly verb-centered (mean Vdev: 6.2) nor construction-centered (mean Cdev: 7.2), suggesting that they relied both on verbs and constructions as sorting criteria. Independent samples t-tests comparing group scores on Vdev and Cdev revealed that G7 produced significantly stronger verb-centered sorting than G10, $t(80) = 2.721$, $p = .008$, $d = .60$, and G10 had stronger construction-centered sorting than G7, $t(80) = 2.551$, $p = .013$, $d = .56$.

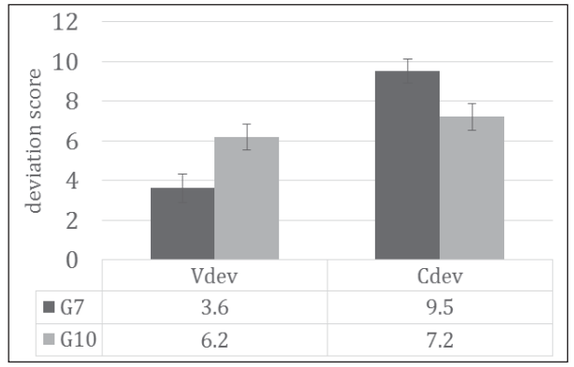

Figure 1 Mean Vdev and Cdev for each group; error bars indicate 95% CIs

We now turn to the results of a hierarchical cluster analysis. Since the students in G7 produced dominantly verb-bias sorting, we ran the cluster analysis only for the sorting data from G10. The dendrogram output of the cluster analysis for G10 is illustrated in Figure 2.

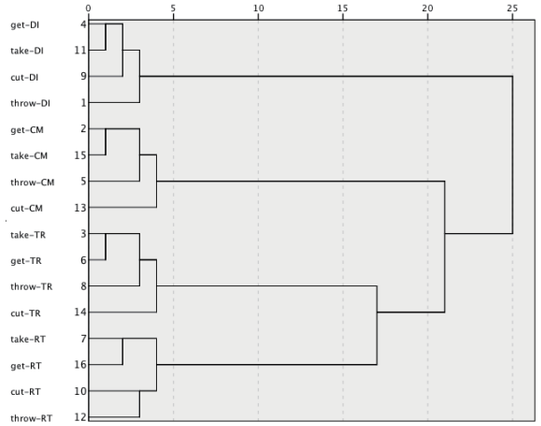

Figure 2 Dendrogram for the clusters produced by G10 (DI = Ditransitive; CM = Caused-motion; TR = Transitive; RT = Resultative)

In the dendrogram, rescaled distance indicates correlation between clustering components: Highly correlated components are marked by a distance value close to zero. Results of the cluster analysis exhibited that the four clusters created by G10 were more biased toward constructions than verbs, although they produced mixed sorts. For example, the first cluster is characterized as the ditransitive construction (sentences 1, 4, 8 and 11), the second cluster as the caused-motion construction (sentences 2, 5, 13 and 15), the third cluster as the transitive construction (sentences 3, 6, 8 and 14), and the fourth as the resultative construction (sentences 7, 10, 12, 16).

Critically, the clusters were more likely to be construction-centered in the presence of the path-breaking verbs. For each constructional cluster, the two sentences containing the path-breaking verbs*get* and *take* were more strongly correlated with each other, as indicated by their low distance values within each cluster (sentences 4 and 11 for ditransitive, sentences 2 and 15 for caused-motion, sentences 3 and 6 for transitive, and sentences 7 and 16 for resultative construction). On the other hand, the sentences with the heavy verbs throw and cut were less strongly associated. These findings indicate that the students in G10 relied heavily on path-breaking verbs in their construction-based sorting, suggesting that the path-breaking verbs raised the students' awareness of constructional meaning.

The results from the sorting task demonstrated that the students in G10, not the learners in G7, were sensitive to constructional meaning by effectively drawing upon path-breaking verbs in their sorting. However, a caution is needed in interpreting these findings, as there are alternative accounts for these outcomes. For example, it is conceivable that the upper-level learners in G10 were more likely to show more construction-based sorting with the path-breaking verbs because they used task-related strategies. In the sorting task, the sentences containing path-breaking verbs bring less attention to the semantic content of the verbs due to their semantic lightness, and as such increased a focus on argument structures. Considering that the older students in G10 had relatively higher cognitive abilities than the younger students in G7, we might interpret the stronger construction-based sorting by G10 as a result of their use of task-specific strategies. Moreover, the null effect of verb type in G7's sorting performance may be explained by their learning environments in the Korean EFL setting. It is generally accepted that the amount of meaningful input provided in the Korean EFL classrooms is restricted due to a large classroom size, time constraints and limited language resources (Yang, 2010). Along with this lack of input, the Korean EFL curriculum often places more importance on sentence forms and grammatical rules rather than meanings. Such a learning environment may have led to the weak reliance on path-breaking verbs for G7, which makes it difficult to properly capture the role of path-breaking verbs in early constructional development for these learners.

To solve the problem associated with the sorting task and minimize potential influence from the learners' learning environments, we provided another group of young EFL learners with a large amount of natural input by engaging them in extensive reading activities and investigated their use of path-breaking verbs in written production (Experiment 2).

6. Experiment 2: Written production

To investigate the extent to which young learners rely on path-breaking verbs in production, we analyzed EFL learners' writing after a month of extensive reading activities. We adopted extensive reading as an input-driven activity to facilitate the process of L2 constructional development, based on the main tenet of usage-based constructional approaches that frequency of language input plays a central role in construction learning (Barlow & Kemmer, 2000; Bybee, 2008; Ellis, 2008; Goldberg, 2006; Langacker, 2000; Tomasello, 2003). We assume that reading in quantity allows students to constantly encounter individual instances of target constructions and boosts their acquisition of abstract constructional knowledge. We implemented the reading activities by closely following the principles of extensive reading that the reading materials should be easy and fun (Day & Bamford, 1998, 2002). We thus provided participants with an access to 2000 grade reader books (i.e., simplified books written for young readers or second language speakers; Claridge, 2012). After one month of extensive reading activities, we investigated participants' written production, focusing on the three constructions that are known to pose learning difficulties to EFL learners – caused-motion, ditransitive and resultative constructions (e.g., Lee & Kim, 2016), and analyzed the students' use of path-breaking verbs in these constructions.

6.1 Participants

Twenty-nine Korean EFL students from grade 4 to grade 7 (10–13 years old, M = 11;8) participated in the current experiment. At the time of data collection, none of these students had stayed in English-speaking countries longer than 2 months. Teachers of these students at school informed that they had not received any English writing instruction and that they had English proficiency equivalent to a beginner level. Yet despite our efforts to recruit students at early stages of constructional development, it was difficult to fully control for variability in the relative amount of exposure to English, since these students differed in their grade, age and experiences of English learning as extracurricular activities. To ensure that the participants had only a little or basic knowledge of the three target

constructions investigated in this study (i.e., caused-motion, ditransitive, and resultative constructions), we assessed students' production of the target constructions in a book report prior to input-driven activities. In a small classroom, each participant was asked to read an English storybook of their own interest and write an essay by describing the plot, main characters, and personal impressions about the plot or the characters. We analyzed sentence structures in each book report and selected students who produced less than 2 tokens of the three target constructions. As a result, 24 students were included in further analyses.

6.2 Procedure

Participants were engaged in a four-week extensive English reading program at an institution in Korea. A 2 hour-session took place three times a week, totaling 12 sessions throughout the program. During each session, participants chose a book of their own preference from a list of 2000 English grade reader books, and read it while listening to audio recordings of the book in a quiet room. The reading activities were purely learner-oriented: Students were allowed to replay the audio as many times as they wanted. If they felt the book they chose too difficult or boring, they could stop and select another book from the list. In this way, each child read 1-2 books each session. After finishing a book, students were checked on their understanding of the reading through a vocabulary test and writing activities. The vocabulary test asked students to fill in blanks within a sentence using the words from the book that they read. In writing activities, participants provided a short written summary of a book they read using 4-5 sentences in English.

After the four-week input-taking activities, participants were asked to write a book report for one of the books they read during the input-taking sessions under the supervision of an instructor. Each book report included a brief summary of the book and students' personal impressions about the plot and characters. During the task, participants were not allowed to refer to the books that they read. Each participant was given an hour to complete the writing. For the purpose of the current experiment, the students' book report was analyzed on a sentence-by-sentence basis.

6.3 Results and discussion

Sentences in the book report were analyzed for the proportion of the seven constructions listed in table 4, including the three target constructions (caused-motion, ditransitive, resultative), and the proportion of path-breaking verbs for these constructions.

The proportion of each construction was calculated as the number of the target construction divided by the total number of clauses in each essay. Incomplete sentences and sentences with incorrect argument structures (e.g., **They made it couldn't*) were eliminated from a further analysis (0.4% of the total data). However, we discounted morphological or spelling errors (e.g., *Peter get his room back*) since they are not crucial for the production of target constructions.

As shown in Table 4, the majority of constructions produced by the children were either a simple transitive construction, or intransitive constructions such as intransitive-unergative, intransitive-motion, and intransitive resultative constructions. In contrast, the three target constructions (caused-motion, ditransitive, and resultative constructions) constituted only a small proportion of overall sentences, confirming the previous findings that these constructions pose challenges to Korean EFL learners (Authors, xxxx; Lee & Kim, 2016; Sung & Yang, 2016). Among the three constructions, the caused-motion construction was produced the most frequently (mean proportion of 0.05), followed by the ditransitive construction (mean proportion of 0.02), and the resultative construction was produced the least among all constructions (mean proportion of 0.005). A one-way ANOVA comparing the proportions among the three constructions revealed a significant difference, ($F(2, 71) = 11.433$, $p < .001$, $\eta^2 = .246$). Tukey post-hoc analyses further showed that a significant difference was found between the caused-motion and ditransitive constructions ($p = .006$) and between the caused-motion and resultative constructions ($p < .001$), indicating that the caused-motion construction was produced more frequently than the other two. However, there was no difference in the proportion of the ditransitive and resultative constructions ($p = .311$).

Table 4. Total number, mean number, and proportion of tokens for the target constructions in participants' written production

Construction	Total number of tokens	Mean number of tokens (SD)	Mean proportion of tokens (SD)
Intransitive-unergative	199	8.29 (3.99)	0.34 (0.11)
Intransitive-motion	41	1.71 (1.88)	0.07 (0.06)
Intransitive-resultative	18	0.75 (0.94)	0.03 (0.04)
Transitive	284	11.83 (5.00)	0.48 (0.14)
Caused- motion	30	1.25 (1.03)	0.05 (0.05)
Ditransitive	13	0.54 (1.02)	0.02 (0.04)
Resultative	3	0.13 (0.45)	0.005 (0.02)

The small number of the resultative construction in the students' essays is reminiscent of the previous findings that this construction is hardly produced by L1 children due to its low frequency in language input (e.g., Snyder, 2001; Stromswold & Snyder, 1995). In case of the production of the ditransitive construction, however, our results contrast with previous findings that this construction is highly frequent in input, and it is one of the earliest constructions acquired by L1 children (e.g., Campbell & Tomasello, 2001). Nevertheless, our participants produced the ditransitive construction significantly less than the caused-motion construction, although these two constructions are comparable in terms of structural complexity. We return to discuss potential explanations for this result in General Discussion.

Turning to the utilization of path-breaking verbs in the target constructions, we counted the proportion of path-breaking verbs out of all verbs used for each target construction. We identified the following path-breaking verbs for each construction, based on previous studies (Ellis & Larsen-Freeman, 2009; Goldberg et al., 2004; Ninio, 1999): put, give, get, take, and show for the caused-motion construction; give, tell, ask, and show for the ditransitive construction; make, get, and keep for the resultative construction. Table 5 presents the verbs used for the three target constructions.

Table 5. Total number, mean number, and proportion of tokens for the target constructions in participants' written production

Construction	Verbs (number of tokens)	Number of path-breaking verbs (percentage)
Caused- motion	**put** (6), **give** (7), **show** (2), **take** (1), change (2), spread (1), send (1), drop (1), let (1), return (1), bring (1), spill (1), borrow (1), carry (1), invite (1), move (1), paint (1)	16 (53%)
Ditransitive	**give** (8), **show** (2), **ask** (1), bring (2)	11 (85%)
Resultative	**make** (2), **keep** (1)	3 (100%)

Note. Path-breaking verbs are highlighted in bold.

The likelihood of using path-breaking verbs in the students' essay was different across the three target constructions. While the children showed a dominant use of path-breaking verbs in the production of the ditransitive (85%) and resultative (100%) constructions, their reliance on path-breaking verbs in the caused-motion construction was relatively low (53%). Notably, in the production of the caused-motion construction, these children employed verbs that do not typically appear in this construction, such as *spread* ("Nick tries to spread out the word 'pen' to his whole school with his six agents"), *drop* ("Atomic bomb was dropped on their family's city"), and *spill* ("Pavel spilled wine on his pants"). In the production of the ditransitive and resultative constructions, by contrast, the verbs were restricted to prototypical and generic verbs, for example, *give* ("Piggle-wiggle gave him magic pen"), *show* ("Mina show him owl"), and *make* ("Grandpa hide his stuff and make Peter late in school and beg the lunch"). These production patterns indicate that the children had begun to show their ability to integrate the caused-motion construction with various non-prototypical verbs. Their dominant use of path-breaking verbs in the other two constructions, in contrast, suggest that their knowledge of these constructions is still in a rudimentary stage, restricting the selection of verbs to those that routinely appear in these constructions.

7. General Discussion

The goal of this study was to investigate how young Korean EFL learners

use path-breaking verbs in the comprehension and production of English argument structure constructions. Both sentence-sorting and written production tasks provided evidence that some learners relied strongly on path-breaking verbs.

In the sentence-sorting task, the higher proficiency group (G10) was affected by verb semantics in their sorting tendency such that they were biased to constructional sorting when the sentences included path-breaking verbs. The close relationship between the presence of path-breaking verbs and construction-based sorting in G10 confirms our prediction that path-breaking verbs facilitate students' access to constructional meaning. This outcome is in line with the prominent role of path-breaking verbs in L1 development (Goldberg et al., 2004; Ninio, 1999), as well as with earlier findings that adult L2 learners were biased to constructional sorting with semantically light verbs (Authors, xxxx).

The students' reliance on path-breaking verbs in the sorting task may relate to the verbs' semantic bootstrapping effect (Ninio, 1999). As reviewed earlier, path-breaking verbs denote prototypical and general meanings, which coincide with constructional meanings. In our sorting task, for example, the verbs *get* and *take* have basic senses that can integrate with the transitive, caused-motion, ditransitive, and resultative constructions. The other two verbs cut and throw, in contrast, carry semantically heavy contents that are compatible only with the meaning of the transitive construction, but not with the meanings of the other constructions. It appears that the high compatibility between these path-breaking verbs and the target constructions gave rise to an increased awareness of constructional meanings. To the extent that the ability to draw upon constructional meaning is indicative of language development (e.g., Authors, xxxx; Gries & Wulff, 2005; Lee & Kim, 2016), the children's increased sensitivity to constructional meaning in the presence of path-breaking verbs suggests that path-breaking verbs serve as a stepping stone in the development of constructional knowledge in the EFL setting.

Unlike the higher-level learners in G10, the lower-level learners in G7 did not show any reliance on path-breaking verbs in the sorting task. We attributed this to the lack of sufficient meaningful input in their learning environments and provided a large amount of input to another group

of young EFL learners in an extensive reading program. As a result, the findings of the production task confirmed the students' strong reliance on path-breaking verbs. More than 50% of the verbs the students used for each target construction were path-breaking verbs. This is in accord with previous findings from L1 children (e.g., Ninio, 1999; Goldberg et al., 2004) and from adult L2 learners (e.g., Ellis & Ferreira-Junior, 2009; Ellis & Larsen-Freeman, 2009), who demonstrated an extensive use of path-breaking verbs in various constructions in spoken production. Our results suggest that the role of path-breaking verbs also manifests from the early periods of constructional learning in the EFL setting when learners are provided with an abundant amount of natural input.

We further found that the degree of reliance on path-breaking verbs varied by constructional type in the production task. The learners relied more heavily on path-breaking verbs in the production of the ditransitive and resultative constructions than in the caused-motion construction. This production behavior is at odds with the production pattern observed in monolingual children or adult L2 learners, whose reliance on path-breaking verbs was consistent across constructions. In the speech samples of monolingual children, for example, Goldberg et al. (2004) found that path-breaking verbs were consistently employed in the production of the caused-motion (57%), intransitive-motion (51%), and ditransitive constructions (53%). Similarly, Ellis and Ferreira-Junior (2009) reported a consistent use of path-breaking verbs in ESL learner speech (*go* constituted 53% of VL, *put* 68% of VOL, and *give* 64% of VOO), but there was no evidence that the degree of reliance on path-breaking verbs was significantly different across these constructions.

A question thus arises as to what led to the different production patterns between monolingual children and adult learners in the previous studies and the young learners in our study. One may ascribe the different outcomes to variability in data types across studies. Unlike previous research that draws upon spoken data, our study collected written production data. Our choice of written data instead of speech samples was due to the restriction of collecting spoken data in the EFL context because it is difficult to expect young EFL children to produce a sufficient number of utterances. In fact, teachers of the participants in this study informed that these learners had

limited proficiency in speaking compared to their reading and writing abilities. Nevertheless, we believe that the difference in the data type does not account for the observed production patterns of these children. Since all the participants completed the production task under the same condition, it appears unlikely that the variability in the degree of using path-breaking verbs across constructions is due to the manner that the data were collected.

A more plausible interpretation of what led to the different degrees of reliance on path-breaking verbs by constructions may be found in the different amount of input that the students received across the target constructions, which may have influenced their use of path-breaking verbs in these constructions. Recall that the primary sources of input for the students were grade reader books. Since grade reader books include fictional stories and adaptions from films and classic stories (Claridge, 2012), they feature many descriptions of dynamic scenes associated with movement. Considering that such descriptions of movement are typically denoted by the caused-motion and intransitive-motion constructions, it is assumed that the high frequency of the caused-motion constructions in the books may have led to more production of this construction relative to the ditransitive and resultative constructions. To corroborate this assumption, we sampled 20 books from the grade reader books that the participants read and calculated the proportion of the three target constructions. Results showed that the caused-motion construction appeared more than four times than the ditransitive and resultative constructions, confirming an asymmetry in the amount of input across the target constructions in the books. It appears that the high frequency of the caused-motion construction facilitated the generalization of the constructional knowledge, which led to the weaker reliance on the path-breaking verbs in this construction. Further support for this conclusion would come from research that manipulates frequency of other constructions in input and examines consequences of this manipulation in students' production.

From a theoretical perspective, our findings align with the usage-based theories of constructional development, according to which language learning is input-driven and involves abstraction of concrete items (Barlow & Kemmer, 2000; Bybee, 2008; Ellis, 2008; Tomasello, 2003, among others). Researchers in this framework propose that path-breaking verbs contribute

to the process of transition from an item-based learning to an acquisition of abstract knowledge of constructions (Goldberg et al., 2004; Ninio, 1999; Tomasello, 2003). Consistent with these approaches, our findings reflect a shift from an item-based learning to an abstraction of constructional knowledge and a facilitative role of path-breaking verbs in this process. For example, the dominant verb-based sorting of the beginner-level learners in G7 is an indication of item-by-item learning in the early stages of language development. On the other hand, the construction-oriented sorting in the presence of path-breaking verbs by the more proficient learners in G10 demonstrates that these learners were gradually moving toward establishing abstract knowledge of construction with the help of path-breaking verbs. Although the participants' construction development as estimated in the sorting task was deemed much slower than we expected due to a lack of input in the EFL setting, the close relationship between proficiency and facility with constructional meaning as well as the interacting role of path-breaking verbs in the sorting task indicate that EFL learners undergo a constructional learning process comparable to L1 children.

Likewise, the different degrees of reliance on path-breaking verbs by constructional type in the production task are consistent with the constructional development depicted in the usage-based framework. The dominant reliance on path-breaking verbs in the ditransitive and resultative constructions suggests that the students were still learning these constructions through the medium of path-breaking verbs. For the caused-motion construction, they employed several verbs that are less associated with this construction. Given that the verb-construction integration is associated with constructional development (Goldberg, 1995; Gries & Wulff, 2005), the students' production pattern in the caused-motion construction suggests that they were advancing toward generalization of knowledge in this construction beyond the verb-centered learning phase. Future research is needed to explore whether these students can further develop constructional knowledge with the ditransitive and resultative constructions and begin to employ non-typical verbs in these constructions.

In a broader perspective, the current findings shed light on effective ways of promoting the development of constructional knowledge in the EFL settings, offering guidelines for organizing the EFL curriculum and

textbooks. In the Korean EFL setting where learners' exposure to the L2 is limited (Yang, 2010), path-breaking verbs may enhance the perceptual salience of relevant constructional meanings. Specifically, early provision of verb-construction pairs that are strongly associated in meaning (e.g., *put* – caused-motion construction) may strengthen the tie between verbs and constructions, encouraging learners to learn form-meaning correspondences and develop them into abstract categories. Moreover, the different degrees of reliance on path-breaking verbs across the constructions in the production task highlights the pedagogical benefits of introducing path-breaking verbs for individual constructions, particularly when the target constructions are less frequent in input, such as the ditransitive and resultative constructions. For these constructions, using path-breaking verbs that express their core meaning, for example, *give* for the ditransitive construction and *make* for the resultative construction (Ninio, 1999), would help raise students' awareness of the constructional meaning, facilitating the generalization of the target constructions.

8. Conclusion

The current study investigated young Korean EFL learners' comprehension and production of English argument structure constructions. Our findings point to the important role of path-breaking verbs in the early development of EFL learners' constructional knowledge. We also note additional enhancement for this study. To convincingly argue for the role of input in the production of path-breaking verbs, we need to collect a larger and more comprehensive corpus that contains information about both input and output and analyze how the frequency of target constructions in input is aligned with that in the students' output. Another testable question that is not addressed in this study is whether the effect of path-breaking verbs would also be witnessed in spoken production. Therefore, future work should supplement our findings with analyses of spoken data collected from oral tasks comparable to a book report employed in this study, such as a retelling task where the students retell what they read from the given text (Joe, 1998). Together with our current findings, these future directions will help deepen our understanding of the role of path-breaking verbs in the

early development of constructions for EFL learners.

References

Abbot-Smith, K., & Tomasello, M. 2006. Exemplar-learning and schematization in a usage-based account of syntactic acquisition. *The Linguistic Review*, 233, 275–290.

Akhtar, N. 1999. Acquiring basic word order: evidence for data-driven learning of syntactic structure. *Journal of Child Language,* 26, 339–356.

Akhtar, N., & Tomasello, M. 1997. Young children's productivity with word order and verb morphology. *Developmental Psychology*, 33, 952–965.

Authors, xxxx.

Barlow, M., & Kemmer, S. 2000. *Usage based models of language. Stanford*, CA: CSLI.

Bates, E., & MacWhinney, B. 1987. Competition, variation, and language learning. In B. MacWhinney Ed., *Mechanisms of language acquisition pp*. 157–193. Hillsdale, NJ: Erlbaum.

Bencini, G. M. L., & Goldberg, A. E. 2000. The contribution of argument structure constructions to sentence meaning. *Journal of Memory and Language*, 43, 640–651.

Bybee, J. 2008. Usage-based grammar and second language acquisition. In P. Robinson & N. C. Ellis Eds., *Handbook of cognitive linguistics and second language acquisition* pp. 216–236. New York: Routledge.

Cameron-Faulkner, T., Lieven, E., & Tomasello, M. 2003. A construction based analysis of child directed speech. *Cognitive Science*, 27, 843–873.

Campbell, A. L., & Tomasello, M. 2001. The acquisition of English dative constructions. *Applied Psycholinguistics*, 22, 253–267.

Casenhiser, D., & Goldberg, A. 2005. Fast mapping of a phrasal form and meaning. *Developmental Science*, 8, 500–508.

Claridge, G. 2012. Graded readers: How the publishers make the grade. *Reading in a Foreign Language*, 24, 106–119.

Croft, W. 2001. *Radical construction grammar: Syntactic theory in typological perspective*. Oxford: Oxford University Press.

Day, R. R., & Bamford, J. 1998. *Extensive reading in the second language classroom*. Cambridge: Cambridge University Press.

Day, R. R., & Bamford, J. 2002. Top ten principles for teaching extensive reading. *Reading in a Foreign Language*, 14, 136–141.

Dodson, K., & Tomasello, M. 1998. Acquiring the transitive construction in English: The role of animacy and pronouns. *Journal of Child Language*, 25, 555–574.

Ellis, N. C. 2002. Frequency effects in language processing: A review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition*, 24, 143–188.

Ellis, N. C. 2008. Usage-based and form-focused language acquisition: The associative learning of constructions, learned attention, and the limited L2 end state. In P. Robinson & N. C. Ellis Eds., *Handbook of cognitive linguistics and second language acquisition* pp. 372–405. New York: Routledge.

Ellis, N. C. 2013. Construction grammar and second language acquisition. In T. Hoffmann & G. Trousdale Eds., *The Oxford handbook of construction grammar* pp. 365–378. Oxford: Oxford University Press.

Ellis, N. C., & Ferreira-Junior, F. 2009. Constructions and their acquisition: Islands and the distinctiveness of their occupancy. *Annual Review of Cognitive Linguistics*, 7, 188–221.

Ellis, N. C., & Larsen–Freeman, D. 2009. Constructing a second language: Analyses and computational simulations of the emergence of linguistic constructions from usage. *Language Learning*, 59, 90–125.

Farrar, J. 1992. Negative evidence and grammatical morpheme acquisition. *Developmental Psychology*, 28, 90–98.

Goldberg, A. 1995. *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Goldberg, A. 2006. *Constructions at work: The nature of generalization in language*. New York: Oxford University Press.

Goldberg, A., Casenhiser, D., & Sethuraman, N. 2004. Learning argument structure generalizations. *Cognitive Linguistics*, 15, 289–316.

Goldberg, A. E. 2013. Constructionist approaches. In T. Hoffmann & G. Trousdale Eds., *The Oxford handbook of construction grammar* pp. 15-31. Oxford: Oxford University Press.

Gries, S. T., & Wulff, S. 2005. Do foreign language learners also have constructions? *Annual Review of Cognitive Linguistics*, 3, 182–200.

Gropen, J., Pinker, S., Hollander, M., Goldberg, R., & Wilson, R. 1989. The learnability and acquisition of the dative alternation in English. *Language*, 652, 203–257.

Joe, A. 1998. What effects do text-based tasks promoting generation have on incidental vocabulary acquisition? *Applied Linguistics*, 19, 357–377.

Keijzer, M. 2007. *Last in first out? An investigation of the regression hypothesis in Dutch emigrants in Anglophone Canada*Unpublished doctoral dissertation. Vrije Universiteit Amsterdam, Amsterdam, the Netherlands.

Langacker, R. 2000. A dynamic usage-based model. In M. Barlow & S. Kemmer Eds., *Usage-based models of language* pp. 1–60. Stanford, CA: CSLI.

Lee, Jin-Hwa, & Kim, Seung-Su 2016. Korean college students' knowledge on English argument structure constructions depending on English proficiency.

Korean Journal of English Language and Linguistics, 162, 121–142.
MacWhinney, B. 2008. A unified model. In P. Robinson & N. C. Ellis Eds., *Handbook of cognitive linguistics and second language acquisition*. New York: Routledge.
Manzanares, J. V., & López, A. M. R. 2008. What can language learners tell us about constructions? In S. De Knop & R. De Rycker Eds., *Cognitive approaches to pedagogical grammar* pp. 198–230. Berlin: Mouton de Gruyter.
Ministry of Education. 2015. *The English National Curriculum*. Seoul, Korea: Ministry of Education.
Ninio, A. 1999. Pathbreaking verbs in syntactic development and the question of prototypical transitivity. *Journal of Child Language*, 26, 619–653.
Pinker, S. 1989. *Learnability and cognition: the acquisition of verb–argument structure*. Cambridge, MA: Harvard University Press.
Snyder, W. 2001. On the nature of syntactic variation: Evidence from complex predicates and complex word-formation. *Language*, 77, 324–342.
Stromswold, K., & Snyder, W. 1995. The acquisition of datives, particles, and related constructions: Evidence for delayed parametric learning. In D. MacLaughlin & S. McEwen Eds., *Proceedings of the 19th Boston University Conference on Language Development* pp. 621–28. Somerville, MA: Cascadilla Press.
Sung, Min-Chang, & Yang, Hyun-Kwon 2016. Effects of construction-centered instruction on Korean students' learning of English transitive resultative constructions. In S. D. Knop & G. Gliquin Eds., *Applied construction grammar* pp. 89–114. Berlin: Walter de Gruyter GmbH & Co KG.
Theakston, A., Lieven, E., Pine, J., & Rowland, C. 2001. The role of performance limitations in the acquisition of verb argument structure. *Journal of Child Language*, 28, 127–152.
Tomasello, M. 1992. *First verbs: A case study of early grammatical development*. Cambridge, MA: Cambridge University Press.
Tomasello, M. 2003. Constructing a language: A usage-based theory of language acquisition. Cambridge, MA: Harvard University Press.
Tomasello, M., & Brooks, P. J. 1999. Early syntactic development: A construction grammar approach. In M. Barrett Ed., *The development of language* pp. 161–190. London: Psychology Press.
Valenzuela, J., & Rojo, A. 2008. What can language learners tell us about constructions? In S. De Knop and R. De Rycker Eds., *Cognitive approaches to pedagogical grammar* pp. 198–230. Berlin: Mouton de Gruyter.
Yang, Hyun-Kwon 2010. Linguistic systems of target language as organizational foundations of foreign language teaching. *The Education of Korean Language*, 133, 63–81.