

The Contextual Effect on the Comprehension of the English Focus Particle *only*

Soyoung Kim

(University of Hawai'i at Mānoa)

Kim, Soyoung. 2011. The Contextual Effect on the Comprehension of the English Focus Particle *only*. *The Linguistic Association of Korea Journal*. 19(1). 117-136. Using a Truth-Value Judgment task (Crain & Thornton, 1998), this study investigates how English-speaking children (4 and 5 years old) understand *only* with the help of a context that facilitates construction of a contrast set. In order to investigate the role of context, children received (1) neutral contexts that do not contain the discursal connector *but*, and therefore do not provide any contrast information, and (2) contrast contexts coordinated by *but*, which builds a discourse relation of contrast, thus guiding children to establish the contrast between a focus set and a set of alternatives. The results reveal that in the neutral context condition, English-speaking children made more errors by failing to restrict the scope of *only* (Crain et al., 1994) than failing to generate contrast information (Paterson et al., 2003). Furthermore, they showed different levels of difficulty with scope assignment depending on the syntactic position of *only*. However, children were significantly better with respect to scope assignment when there was a contrastive context involving *but*.

Key Words: child language acquisition, pragmatic inferencing, focus particle, scope

1. Introduction

Speakers are expected to express what they want to convey in a sentence and hearers understand their message based on what the sentence encodes. Certain linguistic devices lead hearers to access information that is not explicitly denoted by a sentence (Filik et al., 2009). The English focus particle *only* evokes this process in hearers (Jacobs, 1983; Konig, 1991; Rooth, 1992; Paterson et al.,

2003). It indicates that a particular entity or event is contrasted with a set of implicit alternatives. For instance, for a sentence like *only John walked the dog*, the contrast is made between John who walked the dog and unspecified people who did not walk the dog.

Developmental research has addressed the fact that three- to six-year-old children have difficulty acquiring *only* (Crain et al., 1994; Donaldson & Lloyd, 1974; Drozd, 2001). However, studies present divergent views on the locus of children's non-adult-like interpretation of *only* sentences. Some accounts (e.g., Crain et al., 1994) claim that children make errors by failing to use syntactic cues to restrict the scope of *only*. For example, children misanalyzed the syntactic position of *only*, thus evaluating sentences with *only* in a pre-subject position as being in a pre-object position or vice versa. However, other accounts (e.g., Paterson et al., 2003) propose that children's failure to interpret sentences with *only* lies in a poor ability to infer implied information due to their non-adult-like pragmatic knowledge. So, sentences with *only* were interpreted as if they were sentences without *only* in this case. Very recently, Höhle et al. (2009) claimed that a high rate of errors of this syntactic or pragmatic nature might be attributed to the demands imposed by the experimental task. It remains an issue as to which experimental condition enhances children's ability to understand sentences with *only*.

Despite extensive discussion on the acquisition of *only*, previous studies are limited due to a methodological gap. To my knowledge there have been only a few studies (e.g., Gualmini et al., 2003; Drozd & van Loosbroek, 1998) that use a method in which an appropriate context assists children's understanding of sentences with *only*. The current study attempts to fill this gap. It aims to examine how a 'contrastive' context affects children's comprehension of *only* sentences.

The next section provides a brief overview on the syntactic and semantic properties of *only*. I shall also review the relevant literature on the acquisition of *only* in child language before presenting the results of the current research.

2. Theoretical Backgrounds and Previous Studies

In the mental model theory (Johnson-Laird, 1983) of processing a sentence readers or listeners construct a discourse model involving a person, objects, relations and events described by the sentence. With the introduction of *only* to a sentence like *only John walked the dog*, the resulting discourse model includes an explicit set of entities that is specified by *only* at the outset. This psychologically salient set is referred to as a focus set. With *John* circumscribed by *only* as a focus set, parsers infer unspecified people who did not walk the dog as a so-called alternative set or a contrast set. The set of alternatives are inferred from the accepted background by a speaker and a listener. This shared information between them can be based on either world knowledge given there is no discourse context or a referential context (e.g., Frazier, 1999; Sedivy, 2002). Readers or listeners compute unspecified people who did not walk the dog out of their pragmatic knowledge when there is no context. However, if a referential context where John and Mary went to the park is provided, they can infer that Mary did not walk the dog. In this sense, the selection of alternatives is highly context-dependent.

The comprehension of sentences containing *only* makes parsers go through a complicated path of processing, determining the scope of *only* and then computing contrast sets with respect to the focused expression in their mental representation. For instance, when *only* occupies a pre-subject position, it must take just the following subject NP as focus, not assigning scope beyond it into the object NP. That is, the particle cannot be associated with the VP as a whole or with any constituents within the VP. Then, within the restricted scope, parsers construe contrast sets using either their own pragmatic knowledge or discourse context. Therefore, if children have difficulty understanding *only* sentences, the nature of their errors could be associated with either of these parsing components. Two major competing accounts have been advanced that focus on either children's syntactic competence or their use of pragmatic knowledge. Let us consider each account in turn.

Crain et al. (1994) claim that children's erroneous responses to sentences containing *only* are due to their lack of syntactic knowledge. Children are simply deficient in assigning the scope of *only* to the correct constituent. Using

the picture-based truth value judgment task, Crain et al. (1994) investigated how children aged 3 to 6 processed sentences with pre-subject *only* (i.e. *Only the cat is holding a flag*) and pre-verbal *only* (i.e. *The cat is only holding a flag*) respectively. The results showed that most of the child participants (over 65%) adopted a VP-focused analysis of the sentences with pre-subject *only*. In other words, *only* in the pre-subject position was interpreted as though it had scope over the verb phrase. The crucial finding drawn from this study is that children tend to assign the same single representation to sentences regardless of the syntactic position of *only*. The results led Crain et al. (1994) to claim that children fail to use syntactic cues to assign the scope of *only* to the intended constituents of the sentences.

An alternative account of children's errors in interpreting the sentences containing *only* is proposed by Paterson et al. (2003). According to the study, Crain's et al.'s (1994) study has a crucial methodological flaw in that sentences without *only* were not tested as control items. Crain et al. (1994) manipulated the experiment in such a way that sentences with pre-subject *only* were always mismatched with pictures, while sentences with pre-verbal *only* and (if provided) sentences without *only* were always matched with pictures. Within this experimental setting, even if the participants correctly interpret the sentences with pre-verbal *only*, it is not direct evidence that they extend the scope of *only* over the verb phrase. Instead, they are likely to evaluate the sentences with *only* as having the same meaning as their counterparts without *only*. Paterson et al. (2003) propose that the children's interpretive errors with the sentences containing *only* might be due to the failure of computing contrast sets.

To address this issue, Paterson et al. (2003) examined whether children were able to construct a mental model that necessarily included a contrast set. They employed an improved version of the picture truth value judgment task to avoid the methodological flaw observed in Crain et al. (1994). They compared pre-subject *only* (i.e. *Only the fireman is holding a hose*) and pre-verbal *only* (i.e. *The fireman is only holding a hose*) as test items, and sentences without *only* as a control (i.e. *The fireman is holding a hose*) against six pictures depicting events matched or mismatched the sentences one at a time. The result revealed that the children substantially ignored *only* in judging *only* sentences. It

suggests that while easily perceiving a focus set, children were poor at taking contrast information into account. This is problematic when compared with Crain et al. (1994), which claims that children's errors with *only* sentences are a consequence of a lack of syntactic knowledge.

At this point, it is useful to review a fundamental cause of children's interpretive mistakes with the focus particle *only* that has been proposed in much developmental literature. The failure of children's performance in understanding *only* is interpreted in terms of mapping between a linguistic form and its semantic representations (Geurts, 2001; Barwise & Cooper, 1981; Brooks & Braine, 1983). As mentioned earlier, processing *only* sentences stipulates that the parsers establish a focus set and a contrast set. The parsers mentally map the form *only* onto two semantic representations, namely, a focus set and a contrast set. Equipped with well-developed pragmatic knowledge, adults are readily able to access implied information for a contrast set. Thus they build a fine-tuned mapping between *only* and its semantic representations (i.e. a focus set and a contrast set). By contrast, young children (aged 3–6 years), who have presumably less-developed pragmatic knowledge than adults, are not able to access implied information. Therefore, they compute half of the required semantic representations, that is, a focus set alone. Their failure to generate contrast information results in a mismatching between the form *only* and its semantic representations. Following this logic, it is plausible to speculate that a context that facilitates the computation of a contrast set can help children build a finer-tuned mapping between the form *only* and its semantic representation.

In my study, a context including a linguistic cue is assumed to facilitate the computation of a contrast set best. In the literature on discourse structure, the connector *but* is commonly held to indicate a discourse relation of 'contrast' (Umbach, 2004). In (1), *but* indicates that the two conjuncts are in a contrast relation, i.e. between John and Bill.

(1) John is tall, **but** Bill is short.

The semantic component of 'contrast' within *but* is further elaborated in Lakoff (1971). According to Lakoff, *but* connects two semantically contrastive

conjuncts. Elements coordinated with *but* have to be alternatives with respect to each other (Schwabe & Gasde, 2000; Hartmann, 2000). Psychologically, the second conjunct of the *but* sentence triggers an inference which contradicts a default inference resulting from the first conjunct. In this sense, the semantic properties of *but* may correspond to the effect that is induced by the focus particle *only* as follows.

Let us return to example (1). As mentioned earlier, the connector *but* evokes the contrastive relation between two conjuncts (i.e., John vs. Bill). It can be said that the proposition that is specified as being true for a focus set (i.e., X is tall, in which X is 'John') is understood as being false for an alternative set (i.e., not-X is not tall, in which not-X is equal to 'Bill'). I therefore suggest that on encountering the sentence *John is tall, but Bill is short*, a parser might quickly identify John as a focus set and Bill as an alternative set. This study adopts the notion of 'contrast' as it is used by Lakoff (1971), with the default inference triggered by the first conjunct and contradicted by the second conjunct.

The purpose of this study is to investigate how English-speaking children comprehend sentences with *only* with the help of contexts, using a Truth Value Judgment task (Crain & Thornton, 1998). The current study proposes to use *but* in contexts supportive of set computation. According to the intuitions of Umbach (2004) and Lakoff (1971) with respect to the semantic function of *but*, this conjunct can be regarded as a critical linguistic cue that strongly facilitates the notion of contrast.

A Truth Value Judgment task involving contexts (Crain & Thornton, 1998) is characterized by a dynamic presentation of a story acted or played out. In the task, participants are presented with a test sentence that is stated by a puppet (toy characters or props) and are asked to judge whether the sentence describes the event in the story. An experimenter can control both the target sentence and story context. This task has been said to have advantages over other methodological techniques for assessing children's comprehension in developmental studies in this regard. A number of studies examining children's comprehension of *only* have used the TVJT in recent years.

In this study, the target sentences have *only* either in a pre-subject or pre-object position. Previous studies have tended to focus on the question of

children's interpretation of sentences with pre-verbal *only* (e.g., *John only holds a balloon*). Such sentences are ambiguous in that *only* can have scope over the entire VP or the NP within it (i.e. the direct object). Paterson et al. (2003) reported that children experienced greater difficulty evaluating sentences with pre-verbal *only* than pre-subject *only*, and, surprisingly, the same was true of adults. This suggests that the scope ambiguity of pre-verbal *only* incurs extra processing costs. In this paper, in order to exclude the possibility of this extra processing burden, the analysis rests on a comparison of two types of target sentences that do not cause syntactic ambiguity—that is, pre-subject *only* and pre-object *only*.

3. The Present Study

3.1. Method

Participants and Procedure

A total of 30 English-speaking children aged 4 and 5 years with normal hearing and normal vision were recruited from the children's center at the University of Hawai'i at Manoa (UHM) and from preschools in the Manoa area. Children were given a small bag of snacks in compensation for their participation. As a control group, 20 English adult speakers, undergraduate students of UHM, participated in the experiment, for which they were paid \$5.

Participants were tested individually, and a test session lasted approximately 30 minutes. During the TVJT (Crain & Thornton, 1998), each participant heard a story accompanied by pictures shown via Microsoft Power Point slides. A child was shown a picture of a puppet (i.e. Dora) on a computer screen and was introduced to Dora as a friend. The child was asked to listen to a story along with Dora. The puppet was asked to describe what happened at the end of the story. The child was informed that the puppet might understand the story well, thus making a correct statement about it, or she might make a mistake, thus making an incorrect statement about the story. An experimenter asked the child to listen to the

story and comment on the puppet's statement. The child was asked to answer "yes" if what she said was right. Otherwise the child should answer "no". They were encouraged to identify any incorrect statements made by the puppet and to explain their choice to the experimenter.

Materials and Desig

Two types of target sentences were constructed containing *only*. One version had the focus particle *only* preceding the subject noun, as in (2a) (henceforth pre-subject *only*), and the other version had it appearing before the object NP, as in (2b) (henceforth pre-object *only*).

- (2) a. Pre-subject *only*:
 Only Piglet bought the cake.
 b. Pre-object *only*:
 Piglet bought **only** the cake.

For each target sentence, two types of contexts accompanied by story pictures were prepared. Contexts included a sentence either containing *but* or not, as follows:

- i. A *-but context* in which there is no discourse cue *but*, so participants must compute a contrast set, using their own pragmatic knowledge without any contextual assistance¹).
- ii. A *+but context* in which two conjuncts are contrasted with each other by *but*, which guides participants to instantiate contrast sets mentally in contrast with focus sets.



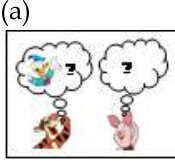
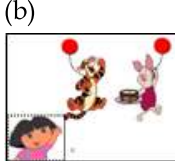
To reduce children's memory burdens, sentences containing *but* always occurred right before target sentences containing *only*. Contexts were given to the participants along with pre-subject *only* and pre-object *only* sentences, respectively. The two sentence types and two kinds of contexts were

1) As a control context, this neutral context is comparable to the context-free condition that was used in the picture judgment tasks in Paterson et al. (2003) and Crain et al. (1994).

completely crossed, leading to four experimental conditions. Three tokens for each condition were composed, resulting in twelve trials.

Each context provided the relevant information corresponding to a four-picture comic strip, as below. As demonstrated in the set of pictures in (3), *-but contexts* did not provide a sentence including *but*. Therefore, given only the description of two characters in the last story picture, participants were asked to judge whether the target sentences were matched/mismatched with the event depicted by the pictures.

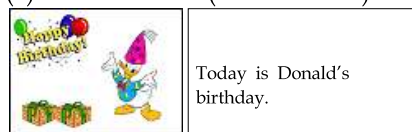
(3) *-but* context (neutral contexts)

	<p>Today is Donald's birthday.</p>		<p>His friends, Tigger and Piglet, went to the store to buy something for the party.</p>
	<p>Tigger had no idea what Donald might like to have. Piglet also did not know what to buy.</p>		<p>After thinking about it, Tigger bought a balloon. Piglet bought a balloon and a cake.</p>

After hearing this story, a puppet made a statement including *only*, as below.

- **Puppet (Dora):** Only Piglet bought the cake (pre-subject *only*).
- **Target Answer:** YES.
- **Puppet (Dora):** Piglet bought only the cake (pre-object *only*).
- **Target Answer:** NO, Piglet bought the balloon, too.

On the other hand, *+but contexts* gave participants a context containing *but*, as demonstrated in the set of pictures (4). This context describes the main character performing an action (e.g., Piglet bought a cake) while the secondary character performs a contrastive action (e.g., Tigger did not buy a cake). After the judgment, children were asked to justify their answers, allowing an experimenter to check whether their responses were the result of correct reasoning or not. Explanations about their judgments were thoroughly hand-recorded for later analysis.

(4) *+but* context (cue contexts)

Today is Donald's birthday.

(a)



His friends, Tigger and Piglet, went to the store to buy something for the party.

(b)



Tigger and Piglet bought a balloon first. After that, Tigger thought of buying a cake and looked at it on display. It was too expensive. Piglet also looked at a cake and it looked very special.

(c)



So, Piglet thought of celebrating the party with a cake. In the end, **Tigger did not buy a cake, but Piglet bought a cake.**

(d)

After hearing this story, a puppet made a statement including *only* as below.

- **Puppet (Dora):** Only Piglet bought the cake (pre-subject *only*).
- **Target Answer:** YES
- **Puppet (Dora):** Piglet bought only the cake (pre-object *only*).
- **Target Answer:** NO, Piglet bought the cake, too.

In addition, three kinds of filler sentences were constructed for the following experimental purposes. First, coordinated sentences without *only* (e.g., Pooh is holding a balloon, but Bunny is holding a cake) were tested to ensure that the participants correctly knew the meaning and function of the discourse connector *but*. Second, as a control condition, sentences without *only* were included and compared with their counterparts with *only* given the same contexts. Third, to ensure that the participants kept paying attention to the task, filler questions were asked about secondary characters not featured in the target sentences (e.g., 'Tigger' in the *+but* context). Four tokens for each sentence were created, resulting in twelve filler trials that were interspersed among the target sentences with *only*.

The task was designed in order to make it practicable for such a young age group. At the beginning of each trial, the experimenter asked the children to name each character and object to ensure that they understood which characters and objects were referred to in the sentences. To reduce the risk that intonation would affect the experiment, the target sentences were always

presented with the same stress pattern. An adult native speaker of English with training in linguistics recorded the target sentences using Audacity. All visual and acoustic material necessary for the experiment was transferred to a laptop that displayed the comic strips and corresponding verbal stimuli.

Predictions

This study explores whether providing context improves the performance of English-speaking children who have problems interpreting sentences with *only*. When there is no contextual help, children can make errors, either failing to assign the scope of *only* to the following constituents (Crain et al., 1994) or failing to generate contrast information (Paterson et al., 2003). More specifically, if children know how to compute a contrast set, but are confused about assigning the scope of *only*, which would allow for spreading of *only* to the constituents to the left or right of it, they are more likely to interpret pre-subject *only* as pre-object *only* or vice versa. On the other hand, if children interpret sentences with *only* as sentences without *only* due to an inability to compute a contrast set, they will judge sentences with *only* to be true in all contexts. This is because the propositions denoted by sentences without *only* are always judged to be true regardless of the context.

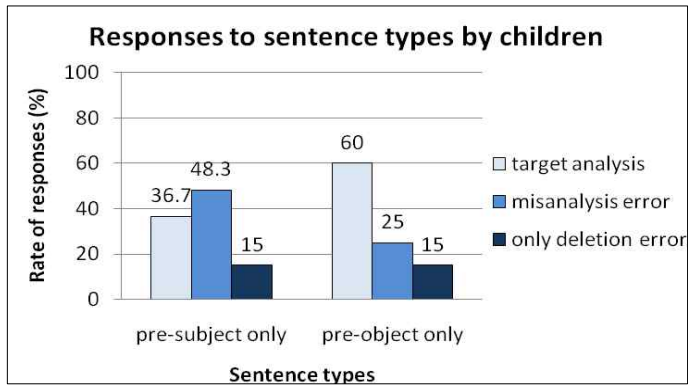
However, if contextual effect is involved in their processing of sentences containing *only*, a strong contrastive context, such as the *+but context*, should lead the children to overcome these errors and to reach to the correct interpretation.

3.2. Results

Participants' responses were first classified into three categories. Responses were coded as "target analysis" if children judged pre-subject *only* and pre-object *only* correctly. Second, erroneous responses were coded as "misanalysis error" if the participants misassigned the scope of pre-subject *only* to the object NP or if they misassigned the scope of pre-object *only* to the subject NP. Third, erroneous responses by participants who understood sentences with *only* as sentences without *only* were coded as "*only* deletion error".

Children's justification why they answered "yes" or "no" were considered in categorizing the responses into three types. This data is important because it reveals the children's reasoning beyond the answers. Within the experimental setting, the target answer for pre-subject *only* is "yes" in employed contexts, just as when children make *only* deletion errors. In other words, the fact that children judged pre-subject *only* correctly is not direct evidence that they restrict the scope of *only* to the subject constituent. To complement this design flaw, children were asked to justify why they answered in such way. If they accepted the sentences with pre-subject *only* because the main character in the picture performed the action denoted by a sentence, whereas the secondary character did not perform any action denoted by a sentence, this is evidence that children were able to compute a contrast set. In other words, they correctly assigned the scope of *only* to the subject constituents. However, if children accepted sentences with pre-subject *only* because the main character in the picture performed an action denoted by a sentence, this is evidence that they were able to perceive a focus set but fail to compute a contrast set. This error was treated as *only* deletion error.

For the three types of filler items, the children showed adult-like performances more than 90% of the time. In particular, it is notable that children gave correct responses to sentences with the connector *but* 90% of the time, which implied that they had acquired its contrastive function and had no difficulty using it as a contrastive cue. As predicted, the adults showed correct responses of 90% for pre-subject *only* and 93% for pre-object *only*. The children, however, had difficulty understanding both sentence types in general. Figure 1 shows their response rates to pre-subject *only* and pre-object *only* in *-but contexts*. This result serves as a baseline of how they comprehended sentences containing *only* without contextual support. Interestingly, a subject-object asymmetry was found in this context. The children had more difficulty with pre-subject *only* than with pre-object *only* (36.7% for pre-subject *only* vs. 60% for pre-object *only*), as shown in Figure 1.

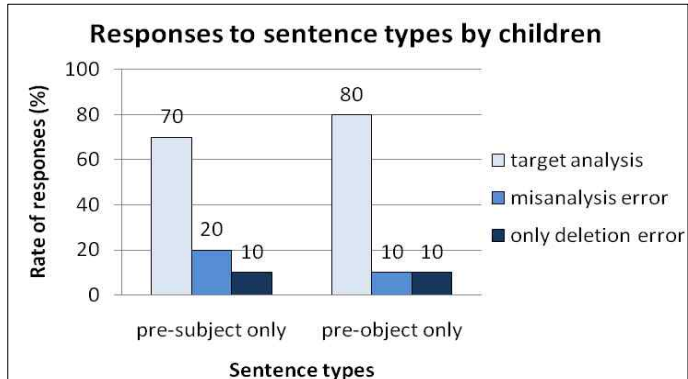
Figure 1. Responses to sentence types by children in *-but* context

It is interesting to take a close look at what kinds of errors the children made in responding to pre-subject *only* and pre-object *only*. In the case of pre-subject *only*, the children were more likely to fail to analyze the scope of *only* by evaluating pre-subject *only* sentences as being pre-object *only* sentences (48.3%) than to fail to generate contrast information (15%). However, in the case of pre-object *only*, although the children were better in restricting the scope of *only* in response to pre-object *only* (60%) than to pre-subject *only* (36.7%), they still made errors by misassigning the scope of *only* to the subject constituents (25%) and failing to compute a contrast set (15%). The findings indicate that without contextual support, children make errors of a syntactic or pragmatic nature, but tend to make more misanalysis errors than *only* deletion errors.

Figure 2 shows how context plays a role in the children's performance on the sentences with *only*. The adults gave correct responses on all items 100% of the time. As illustrated in Figure 2, the most striking aspect of the finding was that the children improved in their ability to comprehend *only* in a dramatic way given *+but* contexts when compared to *-but* contexts. For sentences with pre-subject *only* and pre-object *only*, the rate of correct responses was 70% and 80% respectively in these contexts. More specifically, the children enhanced their ability not only to compute contrast sets, but also to restrict the scope of *only*, which resulted in suppressing the subject-object asymmetry (36.7% in *-but* contexts vs. 70% in *+but* contexts for pre-subject *only* and 60% in *-but* contexts

vs. 80% in *+but contexts* for pre-object *only*).

Figure 2. Responses to sentence types by children in *+but contexts*



3.3. Discussion

Several key findings drawn from this research are summarized as follows. First, the children produced non-adult-like responses to the sentences with *only* in different syntactic positions (i.e. pre-subject *only* vs. pre-object *only*) when no contextual support was provided. There were two kinds of errors in children's performance on the comprehension of sentences containing *only*. The child participants elicited *only* deletion errors when evaluating both sentence types (15% for pre-subject *only* and 15% for pre-object *only*). However, the children made more scope misanalysis errors than *only* deletion errors in both sentence types (48.3% vs. 20% for pre-subject *only* and 25% vs. 10% for pre-object *only*). They adopted an object-focused analysis even in pre-subject *only* sentences. This subject-object asymmetry suggests that pre-subject *only* (i.e. 36.7%) is more difficult for them to understand than pre-object *only* (i.e. 60%). It indicates that the syntactic positioning of *only* influenced the level of difficulty in understanding a sentence containing it.

The second key finding of this study is that *+but contexts* had a significant effect on comprehension compared to the *-but contexts*. The *+but contexts* represent a strong contrastive relation between the first conjunct and the following conjunct, which correspond to a focus set and contrast set,

respectively for sentences with *only*. The *+but contexts* affected the children's performance on assigning the scope of *only* to the following constituents in both pre-subject and pre-object *only*, thus leading to a decrease in scope misanalysis errors. This suggests that discourse manipulation helped them overcome the scope problem. Furthermore, the rate of *only* deletion errors was also reduced when context information helped the children comprehend pre-subject and pre-object *only*.

At this point, it is necessary to consider one issue that can clarify the effect of *+but contexts* on children's comprehension of *only*. To claim that these cue contexts were helpful for children's performances, we need to test whether children aged 4 and 5 know the semantic function of the discourse coordinator *but*. If not, they would fail to use as a cue the contrastive relation between the first conjunct and the following contradictory conjunct. Consequently, it would not assist children to build a contrast set to compare to a focus set in their mental representation. Therefore, sentences containing *but* as fillers were presented, and the child participants were asked to judge whether the pictures were matched/mismatched with the event depicted by the sentences connected by *but*. All of the children, like the adults, exhibited correct responses almost 90% of the time. The result indicates that children who know the function and meaning of *but* successfully integrated cue information into the set computation, which resulted in a dramatic improvement in their performance.

Two remaining questions have not been definitely resolved in this study. First, recall that the children exhibited a subject-object asymmetry in *-but contexts*, but syntactic errors were overwhelmingly reduced when the same items were tested in the *+but contexts*. This finding poses an interesting question as to the role of context in structure building (i.e. syntactic analysis) that has been extensively discussed, with two contradictory models being posited.

The parallel model (McDonald et al., 1994; Crain & Steedman, 1985; Altman & Steedman, 1988) claims that multiple analyses are available simultaneously, and that context plays a crucial role in selecting an appropriate analysis. By contrast, the serial model (Ferreira & Clifton, 1986; Frazier, 1987, 1990) claims that a single analysis is available at the initial parse stage and that context plays a weak role in evaluating the initially built

analysis. Whether either of these two processing models can be directly extended to child processing is at issue. The result of this study, that contextual support increases children's ability to make an appropriate syntactic analysis, is compatible with either model. The current finding (that contexts decrease syntactic errors) does suggest that discourse information plays a big role in the building of syntactic structure in child processing. However, the study leaves the unanswered question of when contextual information is employed by the child participants. Therefore a future study is needed to explore the on-line time course of processing *only* sentences, using a fine-grained methodology such as eye-tracking. It can show the time course of integrating syntactic and discourse information more specifically.

Second, an explanation is needed as to why the pre-subject *only* sentences pose greater difficulty than the pre-object *only* sentences. It may be that the syntactic positions (subject vs. object) play a role here. In the sentences with pre-subject *only*, two arguments, the subject and the object, followed the sentence-initial *only*, whereas in the pre-object *only* sentences, only one argument (i.e. the object) followed the verb. Compared to the relative ease of scope assignment in sentences with pre-object *only*, the children might have had more problems determining the domain of *only* in the pre-subject position. In other words, they might feel confused about where to attach *only* if it is followed by more than one argument, which then leads to the occurrence of scope errors.

4. Conclusion

The findings of the current study underline how English-speaking children comprehend sentences containing *only*. The results of the study show that children face a challenge in understanding sentences with *only* by either failing to compute a contrast set, or failing to restrict the scope of *only*. Children had different degrees of difficulty in assigning the scope of *only* in pre-subject *only* and pre-object *only* sentences, which produced a subject-object asymmetry. However, when assisted by a context which cued them to access the contrast information, the rate of scope-spreading errors and *only* deletion errors was

decreased in both sentence types.

Structures involving focus particles are characterized by integrated information from multiple levels of language such as syntax, semantics, and pragmatics (Matsuoka et al., 2006); parsers should construe a structural representation in accordance with the syntactic position of *only* (Crain et al., 1994; Paterson et al., 2003; Notley et al., 2009). Based on the semantic function of focus particles, the built-up structures are combined with contextual constraints (pragmatics), through which parsers are able to compute a contrast set. This study reveals that children are unlike adults when constructing a structural representation, as manifested by their incorrect assignment of the scope of *only*. However, by integrating contextual information with the structural representation, they are able to reach the intended interpretation of the sentence containing *only*. This suggests that in the developmental stage, discourse factors are at work which enables children to overcome the difficulties of scope interpretation. We now have a more detailed picture of how children aged 4 and 5 establish and integrate specific knowledge in different domains and interfaces during sentence comprehension.

Where does this leave us? Experimental research on other focus particles is still in its early stage in the acquisition field. For instance, from the description of the peculiar properties of *even* in grammar, meaning, and usage in linguistic theory, it can be inferred that the acquisition of *even* might be harder than *only* in child language. Unlike *only* which simply evokes a contrast set, the introduction of *even* a sentence makes speakers or addressees construct mental model in which alternative sets are ordered on a scale of likelihood or expectation in relation to the described event. The value of the *even* phrase is associated with the lowest ranked element on the likelihood scale. For example, given a sentence like *even John got an A+*, John is interpreted to be the least likely one to get an A+ among a set of alternatives. Studies of *even* and *only* can contribute to charting the developmental trajectory of children's ability to integrate pragmatic knowledge with the computation of an alternative set.

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Soyoung Kim
Linguistics Department
University of Hawai'i at Mānoa
569 Moore Hall
1890 East-West Road
Honolulu, HI 96822 USA
Tel: (808) 956-8602
linguist@hawaii.edu

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