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CONTEXTUAL EFFECTS ON THE COMPREHENSION OF THE FOCUS PARTICLE ONLY IN CHILD LANGUAGE

SO YOUNG KIM

This study investigates how English-speaking children understand sentences containing the focus particle *only* and whether contexts that facilitate the construction of a focus set and a contrast set reduce errors. On the assumption that a context that involves instantiating contrast sets should enable children to improve their performance, a Truth Value Judgment task (Crain and Thornton, 1998) was conducted with 20 children (aged 4-5 years). The results showed that the children made errors with the sentences with *only* in either pre-subject or pre-object position. Nevertheless, given a ‘contrastive’ context that strongly facilitates the construction of contrast sets, the children properly assigned scope to either syntactic position, which suggests that discourse factors enable children to overcome the difficulties of scope interpretation.

1. INTRODUCTION. The focus particle *only* characteristically modifies the meaning of a sentence in a unique way. *Only* represents that the extension of some linguistic element is to be contrasted with a set of alternatives (Paterson, Liversedge, Rowland and Filik 2003). A sentence with *only* results in a discourse model in which a set of entities that is made explicit by the sentence (a so-called focus set) is contrasted with a set of alternatives that is presupposed (an alternative set or a contrast set). For instance, on encountering a sentence like *Only John walks a dog*, readers or listeners construct the mental model involving John, a dog and an event described by the sentence, with John circumscribed as a focus set. In addition, they mentally instantiate unspecified people who do not walk a dog and compute them as an alternative set in contrast to the focus set.

Most previous studies report that the semantic interpretation of sentences with *only* is a challenge to children aged 3 to 7 (Crain, Philip, Drozd, Roeper and Matsuoka 1992, Crain, Ni and Conway 1994, Halbert, Crain, Shankweiler and Woodams 1995, Donaldson and Lloyd 1974, Drozd 2001). However, they show divergent views on the locus of children’s non-adult-like interpretation of *only* sentences. Some accounts claim that children make errors with sentences with *only* because they fail to use syntactic cues to restrict the scope of *only*. That is, children deviate from adult-like syntactic knowledge (Crain et al. 1992, Crain et al. 1994). Other accounts (Paterson et al. 2003), however, propose that children’s failure to correctly interpret sentences with *only* lies in a poor ability to employ the pragmatic knowledge that is required to infer implied information and compute it as a contrast set.

Despite the extensive discussion on the acquisition of *only*, previous studies are limited due to a methodological gap. To my knowledge there have been a few studies, (e.g., Gualmini, Maciukaite and Crain 2003; Drozd and van Loosbroek 1998) that take an approach using a method in which an appropriate context assists children’s performance in understanding sentences with *only*. The current study attempts to fill this gap. It aims to examine how a ‘contrastive’ context that facilitates the construction of contrast sets as well as focus sets affects children’s understanding of *only* sentences. My hypothesis is as follows. If children do not take account of contrast information due to their inability to use pragmatic knowledge as claimed by Paterson et al. (2003), contextual support should help them to easily access contrast information and lead to the interpretation of the sentences with *only*. If children’s errors derive from the failure to use syntactic cues to restrict the scope of *only* as indicated by Crain et al. (1994), a context which gives them contrastive cues should lead them to exhibit better performance in scope analysis than they are capable of in the absence of contextual assistance.

*I would like to thank Professor William O’Grady for assisting with this paper. Without his help, it could not have been finished. I also thank Professor Kamil Ud Deen and Professor Amy Schafer for discussing the ideas in this paper at various stages. I also thank Professor Albert J. Schütz and Laurie Durand for editing the paper. Special thanks are due to Jung-Hee Kim for help with the analysis and the discussion. Any remaining errors are my own.*
This point is illustrated in detail as follows. For the sentence *Only John walks a dog*, let us assume a context where Mary, in contrast with John, does not walk a dog. Given the context in which Mary is constructed as a contrast set, children will find it easier to associate *only* with the subject noun, John, rather than the object noun, dog, on hearing the sentence with *only* in the pre-subject position. Consequently, the children should reduce errors concerning scope assignment. This leads us to claim that if children’s problems in interpretation are of a syntactic nature, discourse manipulation can enable them to overcome their lack of syntactic knowledge.

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

2. THEORETICAL BACKGROUND AND PREVIOUS STUDIES. The scope of *only* is restricted to those linguistic constituents that it c-commands in the parse tree (Crain et al. 1994, Reinhart 1983). For instance, *only* which occupies a pre-subject position must take just the following subject NP as its c-command domain, not assigning scope beyond it into NP; therefore, the particle cannot be associated with the VP as a whole or with any constituents within the VP. Likewise, *only* in a pre-object position takes scope over the object constituent, but excluding the upper constituent (i.e., the subject NP) in the parse tree. Semantically, the focus particle *only* is a particular type of quantifying expression that is used to indicate contrastive focus (Rooth 1992). The basic semantic function of the focus particle *only* is to signal that the extension of some linguistic constituent is being contrasted with a set of alternatives (Crain et al. 1994).

From a psycholinguistic perspective, the comprehension of sentences with *only* involves a complicated path of processing, which emerges as a consequence of costly computation for determining focus sets and constructing contrast sets in the parsers’ mental representation. In the mental model theory of processing (Johnson-Laird 1983), readers or listeners evoke the discourse model, including persons, objects, relations and events described by the sentence. The resulting discourse model built by processing *only* sentences requires an explicit set of entities that is specified by the focus particle at the outset. This psychologically salient set is referred to as a focus set. In addition, understanding sentences with *only* triggers a so-called alternative set or a contrast set that is not asserted but presupposed from the focus set in the sentence. The two computed sets (a focus set vs. a contrast set) are in a ‘contrastive’ relation in the mental representation. This point is exemplified in (1a) and (1b) below. When *only* restricts the subject NP as in (1a), it indicates the contrast to be made between Mary as a focus set and other unspecified people as a contrast set (Paterson et al. 2003). Similarly, for the sentence in (1b) with pre-object *only*, speakers identify a focused object NP (i.e. the balloon) under the presupposition that there is something that she does not hold in her hand. Hence, there is a contrast to be established between the balloon as a focus set and other holdable things that she does not hold as a contrast set.

(1) (a) Pre-subject *only*:
Only Mary holds the balloon.

(b) Pre-object *only*:
Mary holds only the balloon.

In sum, processing sentences with *only* requires two crucial components of parsing. Comprehenders are required to determine the scope of the focus particle in accordance with its syntactic position. Then within the restricted scope, speakers construe with the help of pragmatic inferencing contrast sets which are qualitatively different from the focused constituents. Therefore, if children have difficulty understanding *only* sentences, the nature of their errors could be associated with either of the parsing components that have been described. By this I mean that if children fail to use syntactic cues to restrict the scope of *only*, their non adult-like performance is of a syntactic nature. Alternatively, when children fail to use contrast information on contrast sets it can be explained as being due to their inability to combine pragmatic knowledge with computing the contrast sets. Or it could be argued, although I know of no study
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which addresses this issue in depth, that both syntactic-based and discourse-based sources of difficulty are compounded with each other in children’s errors with sentences with only.

Developmental research has repeatedly addressed the issue that 3 to 7-year-old children have difficulty acquiring the focus particle only (Brooks and Braine 1983, Crain et al. 1994, Donaldson and Lloyd 1974, Drozd 2001). Yet there has been no consensus on the locus of children’s non adult-like semantic interpretation of sentences with only. Two major competing accounts have been proposed which focus on either children’s syntactic competence or their use of discourse information. Let us consider each account in turn.

Crain et al. (1992) and 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 constituent that it c-commands. Using the picture-verification task, Crain et al. (1992) investigated how children aged 3 to 6 processed sentences with pre-subject only and pre-object only, respectively. The results showed most of the child participants predominately employed a subject-focused scope analysis with the sentences with pre-object only. That is, they evaluated the sentences with pre-object only as having the same meaning as the sentences with pre-subject only. In Crain et al.’s (1994) study, children also found it difficult to restrict the scope of only. Interestingly, contra the findings of Crain et al. (1992), in Crain et al. (1994), the children adopted an object-focused scope analysis with the sentences with pre-subject only. In other words, only in the pre-subject position was interpreted as though it had scope over the direct object. Irrespective of whether the subject-focused (as in Crain et al. 1992) or object-focused strategy (as in Crain et al. 1994) is favored, the crucial finding from both studies is that children are more likely to assign the same single representation to sentences, with only in both syntactic positions. The results lead Crain et al. (1992) and Crain et al. (1994) to claim that children fail to use syntactic cues to correctly analyze the scope of only to the intended constituents of the sentences.

Endo (2004) extended Crain’s (1994) study to Japanese children’s interpretation of sentences that contain a focus particle dake, equivalent to English only. Japanese children employed an object-focused analysis when dake was associated with the subject NP. In contrast, Matsuoka (2005) observed a large number of errors in which dake was predominately associated with subject NP irrespective of its syntactic position. To sum up, based on these cross-linguistic results, children at an early developmental stage experience difficulty in scope analysis and appear to adopt a preferred scope reading in sentences with focus particles although which preferred scope reading children adopt appears to vary.

An alternative discourse-based 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. This leaves open the possibility that children might misinterpret sentences with pre-subject only as sentences without only. In fact, 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-object only and (if provided) sentences without only were always matched with pictures. Within this experimental setting, even if the participants incorrectly interpret the sentences with pre-subject only, it is not direct evidence that they extend the scope of only over the direct object instead. Pointing out that the children evaluated the sentences with only as having the same meaning as the counterparts without only, Paterson et al. (2003) proposes that the children’s interpretive errors with the sentences with only are due to their non adult-like use of pragmatic knowledge in constructing contrast sets.

To explore this possibility, Paterson et al.’s examined whether children were able to direct the mental model that necessarily included a contrast set as well as a focus set, using a forced-choice picture-selection task. The result revealed that the children substantially ignored only in judging only sentences. Paterson et al. (2003) took this to suggest that while easily perceiving a focus set for the sentence, children were poor at taking account of contrast information. This is problematic when compared with Crain
et al. (1994), which claims that children’s errors with *only* sentences are a consequence of the lack of syntactic knowledge of the focus particle.

At this point, a brief explanation should be made of a fundamental learning issue with regard to the source of children’s interpretive mistakes with the focus particle *only*. In much developmental literature, the failure of children’s performance in understanding *only* has been interpreted in terms of mapping between a linguistic form and its semantic representations (discourse model) (Geurts 2001, Barwise and Cooper 1981, Brooks and Braine 1983). The processing of *only* sentences stipulates that the parsers establish a focus set and a contrast set in their mental representation. That is, the parsers mentally map the form *only* onto two semantic representations, namely, a focus set and a contrast set. Equipped with well-developed processing skills, adults are able to integrate discourse information with the sentence interpretation, by readily accessing underspecified representations for a contrast set. Therefore adults build a fine-grained mapping between a form and its semantic representations, and correctly understand sentences with *only*. By contrast, young children (aged 3–6 years) with presumably less-developed processing skill in discourse inferencing are not able to access unsupported and presuppositional information, and thus fail to have an adult-like mapping between a form *only* and its semantic representations. In other words, their lack of discourse use results in a mismapping in which a form *only* is computed to half of the required semantic representations, such as a focus set alone.

If it is true that children are capable of computing only the focus set, it is plausible to predict that a context that facilitates children’s building of a correct mental model would enable them to fine-tune the mapping between the form and the semantic representations—that is, the two required pairs of sets. For this to happen, the context should conceptualize the notion of contrast which engages a contrast set as well as a focus set. Following this logic, the question then arises whether children can improve their performance on processing *only* when there is a context that assists them to access less specified representations—that is, the contrast sets. Provided a preceding context that conveys a contrast set-related cue, children should successfully compute a contrast set in reference to it in their mental model.

A recent study (Gualmini et al. 2003) investigates English-speaking children’s sensitivity to contextual support in comprehending *only* sentences. To date several researchers have examined how children integrate prosodic information with discourse in comprehending *only* sentences (Drozd and van Loosbroek 1998, Gualmini et al. 2003). Gualmini et al. (2003) took the case of English dative construction with a direct object and an indirect object in which *only* could be associated with either of them (e.g., *Mary only introduced John to Bill*). He manipulated prosodic prominence by stressing either the direct object, John or the indirect object Bill without contextual support. The majority of the children preferred to associate *only* with the indirect object (i.e. Bill) in spite of prosodic prominence upon the direct object (i.e. John). This invites the conclusion that the children did not make use of prosodic information to determine scope analysis of *only* and instead, had a default reading of the association of *only* with the indirect object.

The question remains whether the children are able to associate the focus particle *only* with the direct objects given contextual support. In a follow-up study, Gualmini gave the participants not only contrastive stress on the direct object but also a supportive context which made the indirect-object-preferred reading contradictory. The result revealed that the children were more likely to associate *only* with the direct object when there were both prosodic and discourse cues. The finding suggests that children supported by contextual information integrated with prosodic prominence can be accessible to the direct object-preferred interpretation that they disfavored in a default setting.

The findings of Gualmini et al. (2003) are consistent with the underlying assumption of the current study, which is that children are sensitive to discourse cues in the interpretation of sentences with *only*. What remains to be established, however, is whether context information *per se* plays a role in children’s performance regardless of prosodic prominence. A further question arises as to what sort of context would support the interpretation of *only* sentences.

There is a kind of linguistic context manipulated by discourse cues, which is assumed to best facilitate the computation of a contrast set as well as a focus set. In the literature on discourse structure, two types of discourse cues are known to represent the discourse relation of either contrast or sequence. *But* is
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commonly held to indicate a discourse relation of “contrast,” whereas *and* is held to indicate a “sequential” relation (Umbach 2004). In (2a) the connector *but* indicates that the two conjuncts are in the contrast relation, i.e. between John and Bill. On the other hand, example (2b) presents two conjuncts that are connected by *and* to establish a sequential relation rather than a contrast. Nevertheless, (2b) requires a sort of contrast which is obvious from the fact that substitution of *drink* for *beer* would make the coordination unacceptable (Umbach 2004).

(2) (a) but:
John is tall, *but* Bill is short.
(b) and:
John had a *beer*/*drink* and he also had a martini.

The semantic component of ‘contrast’ within *but* is further elaborated in Lakoff (1971). According to Lakoff, *but* connects two semantically contrastive conjuncts. Coordinated elements with *but* have to be alternatives with respect to each other (Schwabe and Gasde 2000, Hartmann 2000). Psychologically, the second conjunct of a *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*. Let us return to example (2a). 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. Such an effect, by contrast, may be less explicit in sentence (2b). This is because *and* simply connects two conjuncts sequentially, thus evoking a less contrastive relation between them. My study adopts the notion of ‘contrast’ as it used by Lakoff, with the default inference triggered by the first conjunct and contradicted by the second conjunct; in the rest of this paper *and* sentences are treated as indicating a less contrastive relation between a focus set and an a contrast set than *but* sentences.

The purpose of this study is to investigate how English-speaking children comprehend sentences with pre-subject *only* and pre-object *only* given contextual support manipulated by discourse connectors *and* or *but*. The current study proposes to use *and* and *but* in contexts supportive of set computation (henceforth called +*and context* vs. +*but context*). According to the intuitions of Umbach and Lakoff with respect to the semantic function of *but*, this conjunctor can be regarded as a critical linguistic cue to strongly facilitate the notion of contrast, which as a result, would maximally assist children to identify contrast sets. However, *and*, while sequentially connecting two conjuncts, can still evoke a kind of contrast between a focus set and an alternative set, although to a lesser degree than the connector *but*. I therefore expect that *and* will contribute children’s ability to construct two set computations but to only a limited extent.

The effect of +*and context* on children’s comprehension of *only* sentences has already been discussed in several studies. Using a Truth Value Judgment task, Drozd and van Loosbroek (1998) examined how Dutch children (aged 4–5 years) used discourse as a cue when processing sentences with a focus particle *alleen* ‘only’. They reported that a context assisted the children to create a mental representation including alternative sets. They used so-called ‘contrastive reference’ that did not directly contain *and* but presented sequential information to the participants through a series of wh-questions. Let us take a closer look at how this manipulation of ‘contrastive reference’ affects the Dutch children’s building of mental constructions.

In the task, the Dutch children were asked to view a picture that depicted a girl and a boy each holding a paint brush, and then received consecutive questions about two characters, such as *what does the boy have in his hand?* and *what does the girl have in her hand?* Before a target sentence with pre-subject *alleen* ‘only’ (i.e. *Only the boy is holding a paint brush*) is given, not only do the children establish a good understanding of the situation depicted by the picture but they also mentally construe the discourse
model of two characters that are associated with the same action, i.e. holding a paint brush. These structured series of inquiries form a sort of contextual cue, “contrastive reference,” by which the children identify a boy as a focus set and a girl as a contrast set for the target sentence. The results of this study indicated that the children improved their performance on comprehending alleen ‘only’ with the help of ‘contrastive reference’. However, interpretive errors pertaining to scope assignment were still found in spite of the contextual support. This suggests that the role of ‘contrastive reference’ is at play, not to the extent that children can overcome the problems of scope analysis. Based on this empirical evidence, I predict that +and context as analogue to ‘contrastive reference’ would have a limited effect on children’s mental computation. This hypothesis is examined in my study.

In my experiment I reconsider the type of target sentences with only. Previous studies have tended to center around 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 take the 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 sentences with pre-verbal only incur extra processing costs from the comprehenders who opt for either of the scope analyses. In this paper, in order to exclude such an extra processing burden, my 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.

As has been noted by many studies (Endo 2004, Matsuoka 2005), children also demonstrated different levels of difficulty in interpreting only in different syntactic positions (subject position vs. object position). However, no further accounts of subject-object asymmetry have been put forward from processing perspectives. I attempt to fill this gap by exploring this issue in a more focused way in the discussion section.

3 THE PRESENT EXPERIMENT

3.1 Method

Participants. A total of 20 English-speaking children aged from 4 to 5 with normal hearing and normal vision were recruited at the University of Hawai‘i at Manoa (UHM) children’s center. As a control group, 5 English adult speakers who were undergraduate students of UHM participated in the experiment, for which they were paid $5.

Materials and Design. I constructed 2 types of target sentences containing only. One version of the sentences has the focus particle only preceding the subject noun as in (3a) and the other version has it appearing before the object NP as in (3b).

(3) (a) Pre-subject only:

Only Pooh bought the balloon.

(b) Pre-object only:

Pooh bought only the balloon.

For each target sentence, I prepared a context accompanied by story pictures. Each context ended with a manipulated sentence with a discourse connector (i.e. and or but), which always occurred right before target sentences with only. Depending on the nature of discourse connector, 3 kinds of contexts were created: (i) +and context in which two conjuncts are connected by and, which establishes a less contrastive relation between the first conjunct and the second conjunct (Umbach, 2004). Consequently, this context enables participants to evoke a pair of sets that are less contrastive with each other in their mental representation; (ii) +but context in which two conjuncts are contrasted with each other by but, which establishes the discourse relation of contrast, thus guiding participants to mentally instantiate contrast sets in contrast with focus sets when processing only sentences; (iii) neutral context in which no discourse cues such as and or but are included (so-called -and context and -but context), so participants must build up the discourse model using their own pragmatic inferencing without any contextual assistance. As a control context, the neutral context is comparable to the context-free condition that has been used in the picture
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judgment tasks in Paterson et al. 2003 and Crain et al. 1994. Two sentence types and three kinds of context are completely crossed leading to 8 experimental conditions as shown in Table 1. A total of 3 tokens for each condition were composed, resulting in twenty-four trials.

<table>
<thead>
<tr>
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<th>Neutral context</th>
<th>Cue context</th>
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<tbody>
<tr>
<td></td>
<td>and</td>
<td>but</td>
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<tr>
<td>pre-subject</td>
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<td>pre-object</td>
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**TABLE 1. 8 CONDITIONS FOR EXPERIMENT**

Each context was composed of 3 story sentences and 1 cue sentence that provided the relevant information corresponding to a four-picture comic strip, as below. The distinction between neutral context (i.e. -and context and -but context) and cue context (i.e +and context and +but context) is determined by whether the last cue sentence of each context includes and or but. The contexts were given to the participants combined with pre-subject only and pre-object only sentences, respectively. In order to investigate contextual effect *per se* the children were divided into two groups each of which received different types of context.

Group 1 received neutral contexts, as demonstrated in the set of pictures (1) and (2), in which the cue sentences immediately preceding the target sentences with only did not have either and (i.e. -and context like [1]) or but (i.e. -but context like [2]). Instead, given only the description of two characters in the last story picture, the participants were asked to judge whether the target sentences were matched/mismatched with the event depicted by the pictures.

**<Group1> with neutral contexts**

(1) -and context

**Story:** Today is Tigger’s birthday. His friends, Pooh and Bunny, went to the store to buy something for the party. Pooh had no idea of what Tigger might like to have. Bunny also did not know what to buy.

**Cue sentence:** After thinking about the presents, Pooh bought a balloon. Bunny bought a balloon and a cake.

**Puppet:** Only Pooh bought a balloon. **Target Answer:** NO

\(^2\) ‘+’ and ‘-‘ in the Table 1 indicate presence and absence of and/but respectively in the cue sentences.
(2) -but context

<table>
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<th>Image 1</th>
<th>Image 2</th>
<th>Image 3</th>
<th>Image 4</th>
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**Story**: Today is Donald’s birthday. His friends, Tigger and Piglet, went to the store to buy something for the party. Tigger had no idea what Donald might like to have. Piglet also did not know what to buy.

**Cue sentence**: After thinking about it, Tigger bought a balloon. Piglet bought a balloon and a cake.

**Puppet**: Only Piglet bought a cake. **Target Answer**: YES

A second group of subjects was given cue contexts manipulated by *and* (i.e. *+and context* like [3]) and *but* (i.e. *+but context* like [4]), combined with pre-subject *only* and pre-object *only* as demonstrated in the set of pictures (3) and (4). In (3), with a *+and context*, the target sentence describes the main character performing the action (e.g., *Pooh bought a balloon*) and the secondary character performing the same action (e.g., *Bunny bought a balloon*). This context represents focus sets that are somewhat contrastive with contrast sets but to a lesser degree than in the *+but context*. In (4), with *+but context*, the target sentence describes the main character performing an action (e.g., *Pooh bought a cake*) while the secondary character performs a contrastive action (e.g. *Bunny did not buy a cake*). This type of context shows focus sets that contrast strongly with alternative sets.

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<Group 2> with cue contexts

(3) *+and context*

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**Story**: Today is Tigger’s birthday. His friends, Pooh and Bunny went to the store to buy something for the party. Bunny bought a cake. Pooh and Bunny thought of decorating the party room together with balloons.

**Cue sentence**: Therefore, Bunny bought a balloon and then Pooh bought a balloon.

**Puppet**: Only Pooh bought a balloon. **Target Answer**: NO

(4) *+but context*

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<th>Image 1</th>
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**Story:** Today is Donald’s birthday. His friends, Tigger and Piglet, went to the store to buy something for the party. Tigger and Piglet bought a balloon. Later, Tigger thought of buying a cake and looked at it on display. It was very expensive. Piglet thought of celebrating the party with a cake.

**Cue sentence:** Therefore, Tigger did not buy a cake, **but** Piglet bought a cake.

**Puppet:** Only Piglet bought a cake.  **Target Answer:** YES

In addition, a total of 3 kinds of filler sentences were constructed for the following experimental purposes. First, coordinated sentences without *only* (i.e. *Pooh is holding a balloon and Bunny is holding a balloon.*) were tested to ensure that the participants correctly knew the meaning and function of the discourse connectors *and* or *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 sentences were asked about secondary characters who had not been asked about in the target sentences (i.e. ‘Bunny’ in +and context or ‘Tigger’ in +but context). A total of 4 tokens for each sentence was created, resulting in 12 filler trials that were interspersed among the target sentences with *only*.

The task was designed in order to make it practicable for this 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 sentences. To reduce the risk that intonation affects the experiment, I needed to make sure that 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 the responses from the participants were recorded by hand. All visual and acoustic material necessary for the experiment was transferred to a laptop that displayed the comic strips as well as the corresponding verbal stimuli. In this study the two independent variables are context type and sentence type, and the dependent variable is frequency of ‘yes’/’no’ responses to the sentences.

**Procedure.** Participants were tested individually, and each test session lasted approximately 25 minutes. Using the Truth Value Judgment task (Crain and Thornton 1998, Matsuoka 2005) each participant heard a story accompanied by pictures shown via Microsoft Power Point slides. Each participant compared what s/he heard with the corresponding target sentence uttered by a puppet who watched the story along with the child. The participants were asked to answer ‘yes’ if the story was matched with the event depicted by the sentence and ‘no’ otherwise. They were encouraged to identify any incorrect statements made by the puppet and to explain why they thought so to the experimenter.

**Predictions.** The study explores whether English-speaking children with interpretive problems with sentences with *only* improve their performance with the help of context. The children’s performance is expected to be sensitive to context manipulation: *neutral contexts* (i.e. -and context/-but context) vs. *cue contexts* (i.e. +and context/+but context). A strong contrastive context, such as the +but context, should maximally lead the children to access the contrast information, enabling them to successfully compute a contrast set and end up responding correctly to *only* sentences. On the other hand, the +and context that represents a relatively less contrastive relation between a focus set and a contrast set gives rise to two possible outcomes in relation to the *neutral context*. As shown in Figure (1a), if the +and context helps the children to compute a contrast set in the discourse model, the child participants will display better performance in the +and context than in the neutral context, although to a lesser degree by comparison with the +but context. Or, if the +and context is equivalent to the neutral context in facilitating the construction of a contrast set, then the children’s responses to the +and context would be very much like their responses to the neutral context, as illustrated in figure (1b).
(1) (a) *neutral context* < *+and context* < *+but context*

(b) *neutral context* = *+and context* < *+but context*

3.2 RESULTS. Figure 2 shows the mean accuracy of target responses to *neutral contexts* for pre-subject *only* and pre-object *only* by the children and the adults respectively. The adults showed correct responses of 90% or more across all the conditions. The children, however, produced target responses around 50% of the time for sentences with pre-subject *only* and pre-object only in *neutral contexts*. In particular the children found it more difficult to comprehend pre-subject *only* in *-and contexts*, demonstrating by target responses only 36.7% of the time.

![Figure 2. Responses to target sentences by children and adults in neutral context](image)

An inspection of the data shown in figure 3 shows how context plays a role in the children’s performance on the sentences with *only*. As illustrated in table 3, the most interesting finding was that the children improved their ability to comprehend *only* in a dramatic way given *+but contexts*. For both sentences with pre-subject *only* and pre-object only, the rate of correct responses reached 70% and 80% respectively in these contexts. This demonstrates that *+but contexts* help children to better understand *only* sentences than neutral contexts. Likewise, there was a noticeable difference in the children’s performance between *neutral contexts* and *+and contexts* but in a limited way. In *+and contexts*, the children exhibited a dramatic improvement for the pre-subject *only* (36.7% in *neutral context* vs. 53.3% in *+and context*) but the rate of success for sentences with pre-object only (60% in *-and contexts* vs. 55% in *+and contexts*) did not increase at all despite the contextual support.

![Figure 3. Responses to target sentences by children in cue context](image)
As shown in figure 4, a subject-object asymmetry was found in neutral contexts. In other words, 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). However, provided +but contexts, the children overcame a subject-object asymmetry (70% for pre-subject only vs. 80% for pre-object only). These results can be taken as evidence that contextual support enables the children to overcome a subject-object asymmetry.

3.3 DISCUSSION. Two key findings of this research are summarized below. First, the children showed non-adult-like responses to the sentences with only in different syntactic positions (i.e. pre-subject only vs. pre-object only) without contextual support, which is consistent with previous studies (Crain et al. 1992, Crain et al. 1994, Paterson et al. 2003, Halbert et al. 1995, Donaldson and Lloyd 1974, Drozd 2001). However, there was a striking increase in the success rate of the child participants in the task which provided contextual assistance. Children are assumed to have less-developed processing skills in integrating discourse information with the semantic interpretation of only. Nevertheless, the cue contexts (i.e., +and contexts and +but contexts), but not the neutral contexts, allowed them to readily access the implied information related to the contrast set, so that they were able to correctly understand only sentences in the end.

In previous studies involving a Truth Value Judgment task (Crain et al. 1994) or a picture-judgment task (Paterson et al. 2003), participants were presented with story pictures and were left to infer background and presuppositional knowledge of a contrast set. However, in my study, context stories used in the experiment gave hints that allowed the children to easily compute an explicit contrast set. For example, in the situation where only Pooh bought a balloon, the children heard that the other character in the story picture, Bunny, also tried to buy a balloon but ended up failing to do so. This contrastive story line involving Pooh and Bunny in the context conceptually invites the inference that Pooh as a focus set is contrastive with Bunny as a contrast set before processing a target sentence like only Pooh bought a balloon.

We are able to raise another issue regarding whether children aged 4 to 5 know the semantic function of the two kinds of discourse coordinators and and but. If the children do not know these discourse connectors, they will fail to use as a cue the contrastive relation between the first conjunct and the following contradictory conjunct. Consequently, they will fail to build a contrast set against a focus set in their mental representation upon hearing the target sentences with only. I tested sentences containing either and or but as fillers and asked the child participants to judge whether the pictures were matched/mismatched with the event depicted by the sentences connected by either and or but. All of the children, like the adults,
exhibited correct responses almost 90% of the time. I take this result to indicate that the children who correctly understood the discourse cues and but successfully integrated cue information into the set computation in their discourse model and consequently demonstrated a dramatic improvement in comprehension of only when an appropriate context assisted them.

The second key finding of this study is that there was a significant effect of the but contexts compared to the and contexts. The but contexts represent a strong contrastive relation between the first conjunct and the following conjunct which correspond to a focus set and a contrast set respectively for the sentences with only. Recall that the but contexts greatly affected the children’s ability to correctly assign the scope of only to the following constituents in both pre-subject and pre-object positions. This suggests that discourse manipulation helps the children overcome the scope problem.

My study also found that the and contexts helped the children to improve their performance compared to the neutral contexts, but in a limited way. The children made errors for pre-subject only up to 63.3% of the time and for pre-object only 40% of the time in the neutral contexts. Given the and contexts, there was a decrease in the number of error responses for pre-subject only (46.3%), but not for pre-object only (45%). This result appears to be consistent with the finding reported by Drozd and van Loosbroek (1998). In that study, four-to-five-year-old Dutch children received a series of wh-questions on what two characters were doing in pictures (i.e. what is John doing? or what is Mary doing?) before encountering the target sentences with alleen ‘only’. The consecutive inquiries serving as so-called ‘contrastive reference’ appear to be the same as and contexts in the sense that the first question and the following question make subjects mentally compute a focus set for one character and a contrast set for the other character, but two computed sets are less contrastive each other. The findings revealed that there was a slight decrease of error rates in understanding alleen sentences, but of special interest was that the children failed to make use of syntactic cues to restrict the scope of only to the proper constituents in spite of the assistance of ‘contrastive reference’. Similarly, the and context in my study also affected English-speaking children’s computation of a contrast set to some extent (i.e. in pre-subject position), but did not enable them to correctly assign the scope of only to pre-object position.

We have three remaining questions that have not been definitely resolved in this study. First, it was found that the children exhibited a subject-object asymmetry in the neutral contexts but syntactic errors were overwhelmingly reduced when the same items were tested in the but contexts. If this result holds true and is taken to imply that a better context can reduce children’s syntactic errors associated with only, the finding poses an interesting question as to how children’s processing mechanism works as compared to that of adults. In the adult processing literature, the role of context in structure building (i.e. syntactic analysis) has been extensively discussed, with two contradictory models being posited.

The parallel model (McDonald, Pearlutter and Seidenberg 1994, Crain and Steedman 1985, Altman and 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 and 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’s processing is at issue. The result of my study, showing 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 as well as in adult processing. However, the study leaves the unanswered question of when contextual information is employed by the child participants. Therefore a future study needs to explore the on-line time course of processing only sentences, more specifically, the time-course of integrating syntactic and discourse information, using a more fine-grained methodology (e.g., eye-tracking).

Second, an explanation is needed as to why the pre-subject only sentences pose greater difficulty than the pre-object only sentences. Recall that the present study found that children made more errors for the pre-subject only sentences than for the pre-object only sentences in neutral contexts. I provide a conjecture regarding this question. 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 easiness of scope assignment in sentences with pre-object *only*, the children might have had more problems in determining the domain of *only* in the pre-subject position. In other words, the children feel confused about where to attach *only* if it is followed by more than one argument.

Third, we need to think about the task effect. Compared to the methods used in previous research, this study shows the possibility that a ‘better task’ can provide more information on children’s understanding of the focus particle *only*. There is a drastic improvement in the target rates of child participants aged from 4 to 5 in the task involving contextual support. Furthermore a subject-object asymmetry also disappeared in this task. The task effect has recently received some attention in the child acquisition literature. O’Grady et al. (2008) investigated the effect of task design by comparing children’s performance on a traditional judgment task with their performance on an act-out task for sentences containing quantifiers. This study shows a striking increase in the children’s success rates with the act-out task. For my further studies, it suggests that a better designed task also needs to be conducted in children’s comprehension of *only* sentences.

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*, but that when assisted by a context which cues them to access the contrast information, children are able to improve their performance. This suggests that discourse factors are at work in the developmental stage and enable children to overcome the difficulties of scope interpretation.

REFERENCES


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