

Focus Association in Child Mandarin

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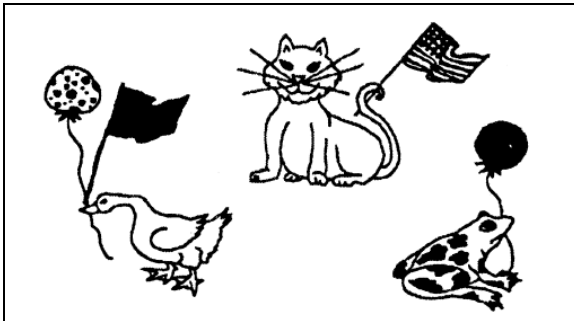
1. Introduction

Over the past twenty years, non-adult interpretations of the simple sentences with the focus operator, such as *only*, have been found in child English (Philip 1992; Crain et al. 1994; Notley et al. 2009) and child Mandarin (Yang 2000; Notley et al. 2009, Zhou & Crain 2010; Lee & Wu 2011). Children tend to accept the sentences (1) and (2) when presented with the picture (3) in which a cat is holding a flag and a duck is holding a flag and a balloon. But for adults, the sentence (1) is an incorrect description of the picture while the sentence (2) is the only correct one. On the other hand, some children would reject the sentence (2) by saying that the duck is also holding a flag.

(1) Only the cat is holding a flag.

(2) The cat is only holding a flag.

(3)



Cited from Crain et al. (1994)

Three accounts have been proposed to explain children's non-adult responses. One view holds that children tend to associate the pre-subject focus operator with the VP (Crain et al. 1994; Notley et al. 2009; Zhou & Crain 2010). Another view holds that children simply fail to process the contrastive

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information conveyed by the focus operator (Paterson et al. 2003). A third view holds that children have freedom of scope (Philip 1992). If children interpret the pre-subject focus operator as the pre-VP one, they are expected to assign a focus interpretation to any element within the VP that bears focus. That is to say, they should assign the contrastive focus to the verb and the object in a similar way. If children do fail to process the contrastive information due to their limited processing resources, the occurrence or the placement of the focus operator should make no difference in their responses. If children have freedom of scope in focus interpretation, they should also freely associate the pre-VP focus operator with the subject. In the present study, we examined Mandarin-speaking children's responses to the sentences with and without the focus operator in pre-subject or preverbal positions and found that the data conformed to none of the accounts.

2. The meaning of *zhi*(*you*)

Only has been the focus in the study of the focus operator for the past 40 years (Jachendoff 1972; Rooth 1985, 1996; Krifka 1991, 1992; Beaver & Clark 2003; Sudhoff 2010). Sentences containing *only* have different truth conditions from those of the corresponding sentences without the focus operator. The meaning of a sentence with a focus operator always includes the meaning of the corresponding sentence without it, as indicated in (4).

- (4) Only the cow lifted the car.
 Presupposition: The cow lifted the car.
 Assertion: No one distinct from the cow lifted the car.

The truth conditions of the sentences with *only* depend on the location of the focus. The truth conditions of the sentences without the focus operator normally do not depend on the focus-background partition (Sudhoff 2010: 48-49).

The focus association is subject to the c-command condition. The pre-subject *only* can only associate with the subject NP which is in its c-command domain as shown in (5). In principle, the preverbal *only* can associate with the whole VP, the verb or the object NP, but cannot associate with the subject that is outside its c-command domain as illustrated in (6). While sentences with the preverbal *only* are ambiguous, those with the pre-subject *only* are not.

- (5) a. Only [the cow]^F lifted the car.
 b. *Only the cow [lifted the car]^F.
 c. *Only the cow [lifted]^F the car.
 d. *Only the cow lifted [the car]^F.
 (6) a. The cow only [lifted the car]^F.
 b. The cow only [lifted]^F the car.
 c. The cow only lifted [the car]^F.
 d. *[The cow]^F only lifted the car.

Unlike *only* in English, *zhi* 'only' in Chinese, being an adverb, cannot be followed by a noun phrase directly. When it precedes an NP, it must be used with *you* 'have' to form a structure like *zhi-you* 'only-have'. Usually *zhi-you* occurs before a subject NP, but never before an object NP. When *zhi* is used in the preverbal positions, it can associate with the whole VP or any element within the VP that bears focus.

3. Previous studies

Crain et al. (1994) found that some of the 3- to 6-year-old English-speaking children accepted both (1)

and (2) as true descriptions of the picture (3). Yang (2000) found that the 4- to 6-year-old Mandarin-speaking children interpreted the pre-subject *zhi-you* sentences and the preverbal *zhi* sentences in a similar way. Based on their observations, these authors claimed that children first adopted a VP-oriented analysis (Crain et al. 1994) or predicate-focus analysis (Yang 2000) of the focus operator in early language development. Paterson et al. (2003) argued that children's non-adult performance resulted from their failure in processing the contrastive meaning conveyed by the focus operator *only*. That is, children failed to process the assertion part of the meaning, though they could process the presupposition part of the meaning. Notley et al. (2009) and Zhou & Crain (2010) found that 4-year-old Mandarin-speaking children performed non-adult responses to the pre-subject *zhi-you* sentences. For example, children were presented with a story in which a cat ate a fish and a carrot whereas a rabbit ate a carrot, but not fish. They rejected the sentence (7) by pointing out that the cat also ate a carrot. Similarly, they rejected the sentence (8) by saying that the cat also ate fish.

- (7) Zhi-you mao xiansheng chi-le yu.
only-have cat sir ate fish
'Only Mr. Cat ate fish.'
- (8) Zhi-you mao xiansheng chi-le huluobo.
only-have cat sir ate carrot
'Only Mr. Cat ate a carrot.'

These authors argued that children did process the contrastive meaning of the focus operator. Otherwise, they should accept both (7) and (8) since the cat did eat the thing mentioned in the sentences. Children's problem resulted from their misinterpreting the pre-subject *zhi-you* sentences as the preverbal *zhi* sentences. That is, they assigned the VP-scope to the sentences with *zhi-you* which should be associated with the subject. Paterson et al. (2005/2006) pointed out that the sentences containing the preverbal focus operator are ambiguous since the contrastive focus can be assigned to the whole VP, the verb or the direct object within the VP. They found that English-speaking children and adults had a strong preference for analyzing the ambiguous sentences with the preverbal *only* by assigning the contrastive focus to the VP, rather than to the direct object.

4. Experiment

In this experiment, we investigated Mandarin-speaking children's interpretation of the sentences with the focus operator in pre-subject or preverbal positions and those without the focus operator. Three questions were addressed our experimental study:

- a. Do children interpret the pre-subject focus operator as the pre-VP one?
- b. Do children fail to process the contrastive information conveyed by the focus operator?
- c. Do children have a free association of focus?

4.1. Participants. Participants were 18 Mandarin-speaking children (9 girls and 9 boys, between the ages of 4;6 and 4;11, with a mean age of 4;9). They were from a kindergarten in Beijing and acquiring Mandarin Chinese as their first language. They had normal hearing and speech capacities. Ten adults were included as controls. They were native Mandarin speakers pursuing their studies in Hong Kong.

4.2. Stimuli. Three types of sentences were tested in the experiment: (a) sentences without the focus operator; (b) sentences with the focus operator *zhi-you* 'only-have' in the pre-subject positions; and (c) sentences with the focus operator *zhi* 'only' in the preverbal positions. The sentences were used in two types of contexts: one in which the sentences were true and the other in which the sentences were false.

Two types of stories were designed: one in which two actions accomplished by two different verbs were performed on the same object; and the other in which two actions accomplished by the same verb were performed on two different objects. Thus, there were four conditions: Different Verb True Condition, Different Verb False Condition, Different Object True Condition, and Different Object False Condition. The sentences without the focus operator were used in the contexts in which the corresponding sentences with the focus operator were false. Each sentence type was given four trials. Each sentence was used to describe a single story. Therefore, there were 32 sentences with the focus operator (4 trials x 2 sentence types x 2 contexts x 2 story types) and 8 sentences without the focus operator (4 trials x 1 sentence type x 1 context x 2 story types).

A sample story used in Different Verb False Condition was illustrated by the pictures in (9). In this story, a boy named Mingming made a snowman with his father. The boy wanted to move the snowman home. So he pushed it and also asked his father to help him. His father stopped him by saying that the snowman would be melted indoors. In this situation, the sentence (10) was false because the father also made the snowman.

(9)



(10) Zhi-you Mingming dui-le xueren.
 only-have Mingming made snowman
 ‘Only Mingming made the snowman.’

A sample story used in Different Object True Condition is illustrated by the pictures in (11). In this story, a horse and a cow wanted to lift a desk and a car using their horns. The horse lifted the desk, but failed to lift the car because his horn was not strong enough. The cow lifted both the desk and the car. In this situation, the sentence (12) was true since the horse didn’t lift the car.

(11)



1



2



3



4

- (12) Zhi-you niu dingqi-le qiche.
only-have cow lifted car
'Only the cow lifted the car.'

4.3. Procedure. Children were interviewed individually in a quiet room near their classroom. The truth value judgment task was used (Crain & McKee 1985; Crain & Thornton 1998). The task was accomplished by two experimenters. One acted out the stories one by one to each child by manipulating the toy characters and props. The other played the role of a puppet who watched the stories with the child. At the end of the story, the puppet would say what he thought had happened in the story. The child task was to judge whether the puppet's statement (i.e. the test sentence) was true or false according to his or her understanding of the story. Children were required to justify their judgments by the follow-up questions. The adults watched the video-taped clips of the stories just as presented to the child in a group and wrote down their judgments on the answer sheets.

4.4. Results. The participants' acceptance or rejection of three or four trials was considered as their consistent responses to the sentence types under investigation. Overall, no gender effect was detected. First, we consider children's and adults' responses to the sentences with the focus operator in true and false contexts. Figure 1 shows that adults consistently accepted the sentences in true contexts while consistently rejecting them in false contexts. Children's responses indicate that they were sensitive to the contexts where the focus operator should be used. Almost all children consistently rejected the sentences with the focus operator when they were false in the context. When the sentences were true in the context, fifteen children (83%) consistently accepted them when different verbs were involved in the stories. When different objects were involved in the stories, ten children (56%) consistently

accepted the pre-subject *zhi-you* sentences and all children (100%) consistently accepted the preverbal *zhi* sentences. From children's justification of their rejections of the pre-subject *zhi-you* sentences in Different Object True Conditions, we found that they rejected the sentences by saying that the character in question also performed the action mentioned in the sentence on another object, thus associating the focus with the object.

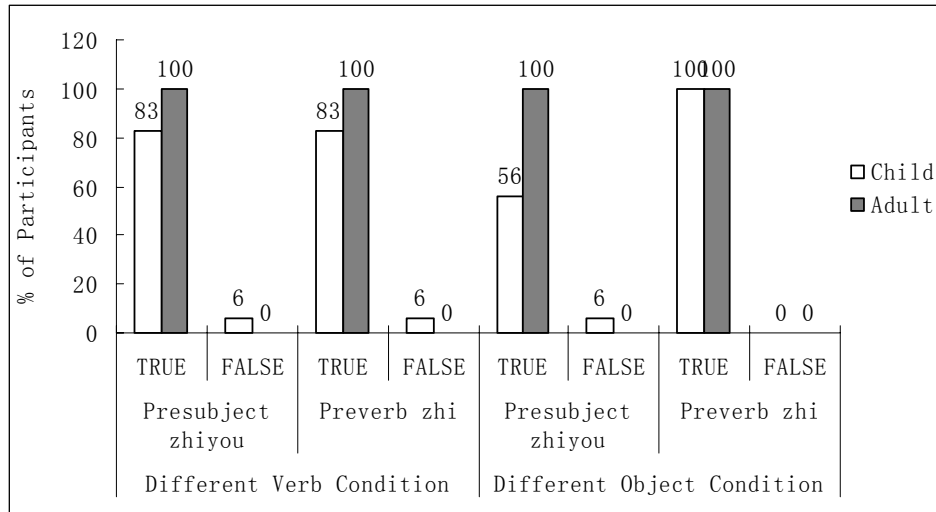


Figure 1. Percentages of participants' consistent acceptance of the sentences with the focus operator in Different Verb/Object True/False Conditions

Next, we consider children's and adults' responses to the sentences with the focus operator and those without it. Figure 2 shows that all adults (100%) consistently rejected the sentences with the focus operator when they were false in the context while they did not reject those without the focus operator in the same contexts in Different Verb/Object Conditions.

When the stories involved two actions performed by different verbs as illustrated by the pictures in (9), i.e. in Different Verb Conditions, four children (22%) consistently rejected the sentences without the focus operator by saying that the action mentioned in the sentence was also performed by another character in the story, thus assigning a contrastive focus to the subjects. Thirteen children (72%) consistently rejected the pre-subject *zhi-you* sentences when they were false in the context by pointing out that another character in the story also performed the action mentioned in the sentence. Eleven children (61%) consistently rejected the pre-verbal sentences when they were false in the context by pointing out that the character in question also performed another action on the same object mentioned in the sentence. From children's justifications of their non-adult rejections of the pre-subject *zhi-you* sentences, we found that three children (17%) consistently associated the pre-subject focus operator with the verbs by saying that the character in question also performed another action on the same object mentioned in the sentence. From children's justifications of their non-adult rejections of the pre-verbal *zhi* sentences, we found that four children (22%) consistently associated the pre-verbal focus operator with the subjects by saying that another character in the story also performed the action mentioned in the sentence.

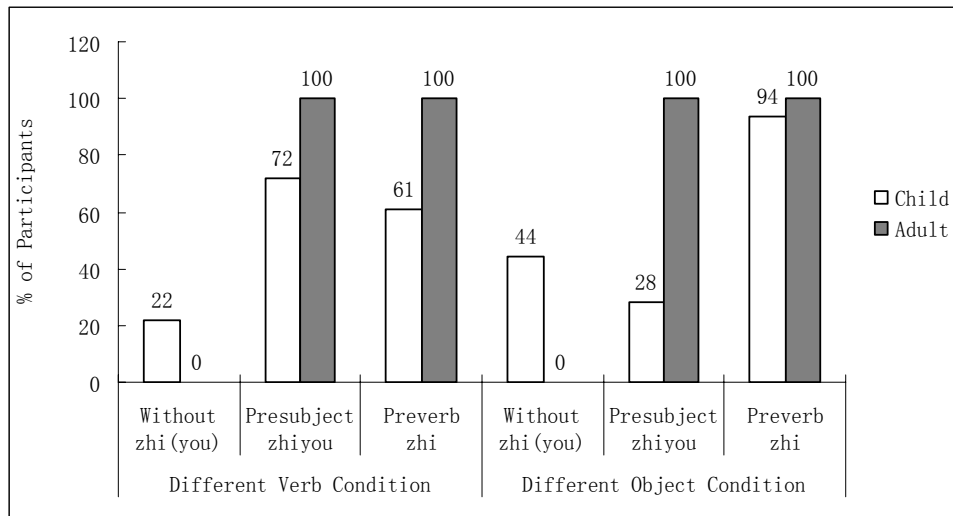


Figure 2. Percentages of the participants' consistent rejection of the sentences with and without the focus operator in Different Verb/Object Conditions

Children's responses to the pre-subject *zhi-you* sentences and those without the focus operator were significantly different ($F(1,34)=78.260, p<.001$). Children's responses to the pre-verbal *zhi* sentences and those without the focus operator were also significantly different ($F(1,34)=47.332, p<.001$). The results indicate that children made a significant distinction between the sentences with the focus operator and those without it. Children's adult-like responses to the pre-subject *zhi-you* sentences and the preverbal *zhi* sentences were similar ($F(1,34)=.786, p>.05$).

When the stories involved two actions performed by the same verb on different objects as illustrated by the pictures in (11), i.e. in Different Object Conditions, eight children (44%) consistently rejected the sentences without the focus operator by saying that the character in question also performed the action mentioned in the sentence on another object, thus assigning a contrastive focus to the objects. Only five children (28%) consistently rejected the pre-subject *zhi-you* sentences when they were false in the context by pointing out that another character in the story also performed the action mentioned in the sentence. Seventeen children (94%) consistently rejected the pre-verbal *zhi* sentences when they were false in the context by pointing out that the character in question also performed the same action mentioned in the sentence on another object. From children's justifications of their non-adult rejections of the pre-subject *zhi-you* sentences, we found that twelve children (67%) consistently associated the pre-subject focus operator with the objects by saying that the character in question also performed the action mentioned in the sentence on another object. From children's justifications of their non-adult rejections of the pre-verbal *zhi* sentences, we found that only one child (6%) consistently associated the pre-verbal focus operator with the subjects by saying that another character in the story also performed the action mentioned in the sentence.

Children's responses to the pre-subject *zhi-you* sentences and those without the focus operator were not significantly different ($F(1,34)=.447, p>.05$). Children tended to associate the pre-subject focus operator with the objects. Even without the focus operator, they also tended to assign a contrastive

focus to the objects. Children did not associate the preverbal focus operator with the objects. Thus, children's responses to the pre-verbal *zhi* sentences and those without the focus operator were significantly different ($F(1,34)=12.230$, $p<.01$). Children's responses to the pre-subject *zhi-you* sentences and the pre-verbal *zhi* sentences were also significantly different ($F(1,34)=38.597$, $p<.001$).

Now, we compare children's responses to the three sentence types in different conditions. Children performed more non-adult responses to the sentences without the focus operator in Different Object Conditions than in Different Verb Conditions. The difference was significant ($F(1,34)=24.850$, $p<.001$). Children performed more non-adult responses to the pre-subject *zhi-you* sentences in Different Object Conditions than in Different Verb Conditions. The difference was also significant ($F(1,34)=40.800$, $p<.001$). The results suggest that children were more sensitive to different objects than to different verbs when interpreting the pre-subject *zhi-you* sentences and the sentences without the focus operator. Children performed more non-adult responses to the pre-verbal *zhi* sentences in Different Verb Conditions than in Different Object Conditions, though the difference was not significant ($F(1,34)=3.898$, $p=.057$). This indicates that children were more sensitive to different verbs than to different objects when interpreting the pre-verbal *zhi* sentences.

5. Findings and discussion

The main findings of the study are summarized as follows: (a) children tended to associate the pre-subject focus operator with the object, rather than the verb; (b) even without the focus operator, children tended to assign the contrastive focus reading to the object, rather than other elements; (c) some children even associated the preverbal focus operator with the subject; and (d) the occurrence of the pre-subject focus operator evoked children's sensitivity to the focus interpretation of the object and the occurrence of the pre-verbal focus operator did not evoke children's sensitivity to the focus interpretation of the subject.

Based on these findings, we consider the three questions addressed earlier. The finding (a) cannot be fully explained by the VP-oriented account or the predicate-focus account, which predicts that the pre-subject focus operator should be associated with the object and the verb with equal force. This finding cannot be explained by the processing account either since children should have accepted the sentences regardless of the occurrence or placement of the focus operator according to these accounts. Furthermore, the finding cannot be explained by the free focus association account, given that the verbs, the objects as well as the subjects should have the same freedom of being associated with the focus. The finding (b) cannot be explained by the VP-oriented or predicate-focus analysis of the focus operator because children were sensitive to the objects of the sentences with and without the focus operator. Moreover, the finding cannot be explained by the free focus association account because children tended to assign a contrastive focus to the objects, but not the subjects of the sentences without the focus operator. The finding (c) is unexpected by the VP-oriented or predicate-focus account. The free focus association account cannot explain the asymmetry between the subject-focus association and the object-focus association. The processing account cannot explain the asymmetry either. The finding (d) cannot be explained by the VP-oriented or predicate-focus account since the occurrence of the focus operator could evoke children's sensitivity to the focus interpretation of the objects and the subjects

alike. It cannot be explained by the processing account either. According to this account, children would not be sensitive to the occurrence of the focus operator. The free focus association account cannot explain why the occurrence of the focus operator did not evoke children's sensitivity to the focus interpretation of the verbs. The present findings suggest that none of the three accounts can adequately explain children's way of focus association.

The remaining question is why children are so sensitive to the objects. Yang (2000) argues that 'predicate-focus serves the communicative function of commenting on a given topic whereas subject-focus serves the function of identifying a reference in the discourse domain. Thus the predicate-focus structure reflects an isomorphic mapping relation between pragmatics and syntax-semantics, but the subject-focus structure reveals a non-isomorphic mapping relation between pragmatics and syntax-semantics. In this way, the predicate-focus structure corresponds to the unmarked topic-comment structure, but the subject-focus structure does not.' Although Yang's analysis captures the property of the predicate which provides new information concerning the subject, it does not explain why children are so sensitive to the object, rather than the verb of the predicate. One possible reason is that the action accomplished by the verb vanishes in time, but the entities represented by the objects which the action is performed on remain there to draw children's attention. However, this account fails to explain why children are less sensitive to the entities represented by the subjects which are also left there to draw their attention. Notice that the subjects are action performers which, of course, could remind children of the past events. If it is not the distinction between the entity and the abstract action that plays a role in children's focus interpretation, then what makes children so sensitive to objects in focus association? Specifically, why do children even tend to associate the pre-subject focus operator with the objects? A possible account is that children at an earlier age have not learnt how to distinguish information focus from semantic focus. Information focus or natural focus usually falls on the object whereas the semantic focus is introduced by the focus operator. Natural or information focus may be the default or unmarked focus that children acquire earlier, and their acquisition of semantic focus as well as their ability to distinguish information focus from semantic focus develops over time. Therefore, they tend to associate the focus operator with the natural focus before they have acquired semantic focus and learnt how to make a distinction between semantic focus and natural focus.

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