

Japanese-Speaking Children's Accessibility to Multiple Readings in the Interpretation of Negative Sentences with the Focus Particle *Dake*

Miyuki NOJI*

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ABSTRACT

This paper investigates how Japanese-speaking young children interpret ambiguous negative sentences containing *dake* 'only' in the indirect object position, based on some results from two experiments using a truth value judgment task. The data from 18 Japanese-speaking children and 18 adult controls show that children, like adults, demonstrated high accessibility to both the surface scope and the inverse scope readings. These findings support Lidz and Musolino's (2002) position that children's scope resolution does not depend on the surface word order between a scope bearing element and negation, but they cannot be explained under the 'Isomorphism by Default' hypothesis in Musolino and Lidz (2006), which posits a preference for the surface scope reading. Our results are rather more compatible with an approach such as the 'Question Answer Requirement' hypothesis (Hulsey et al., 2004), which does not assume such a preference.

Key Words :

Language acquisition, Japanese, negation, *dake*, scope resolution

1. Introduction

The interpretation of a focus particle in negative sentences involves multiple levels of linguistic knowledge: not only syntax and semantics but also phonology and pragmatics. Let us first consider the role that the Japanese focus particle *dake* plays in the interpretation of sentences such as (1).

- (1) Airi-dake-ga gakkō-e it-ta.
Airi-only-NOM school-to go-PAST¹
'Only Airi went to school.'

(1) has (2a) as part of its meaning, and the focus particle gives the sentence an additional meaning in (2b) (Teramura, 1991).

- (2) a. Airi went to school.
b. Nobody other than Airi went to school.

Thus, exclusive particles such as *dake* contribute to the meaning of a sentence by introducing a quantificational force (König, 1991).

When *dake* occurs with negation in a sentence as in (3), the scope interaction between the two elements brings about two interpretations which can be shown as in (4).

- (3) *pro* Kazuko-dake-ni hon-o kasi-te-nai.
pro Kazuko-only-DAT book-ACC lend-ASPECT-not
'He/she has not lent a book only to Kazuko.'
- (4) a. It is only to Kazuko that he/she has not lent a book.
b. It is not only to Kazuko that he/she has lent a book.

(4a) and (4b) correspond to the inverse scope reading (ONLY > NEG) and the surface scope reading (NEG > ONLY) respectively, since negation c-commands the focus particle in (3). The sentence with the inverse scope reading is uttered as two phonological phrases with an internal prosodic boundary after the indirect object, while that with the surface scope reading is uttered as one phonological phrase with no prosodic boundary.

In construing the sentence in a given context, the listener needs to identify Kazuko (a focus set) and the other members (a contrast set) in the discourse. Since *dake* introduces an exclusive contrast as its lexical property, the focus set and the contrast set are assigned the property of not having been lent a book and the property of having been lent a book respectively, when the focus particle takes scope over negation as in (4a). When it is within the scope of negation as in (4b) and the exclusive contrast is negated, not only the focus set but also at least one member of the contrast set is assigned the property of having been lent a book.

One of the interesting issues concerning children's comprehension of negative sentences that contain a scopal element is whether there is a preference for surface scope interpretations, causing children's non-adult behavior in accessing inverse scope interpretations. Musolino and Lidz (2006) assume a default preference for surface scope ('isomorphic' in their terminology) interpretations. Another view which does not assume such a preference is the Question Answer Requirement Hypothesis in Hulsey et al. (2004), which claims that children can access an interpretation as far as it constitutes a good answer to the question under consideration, irrespective of whether it is a surface scope interpretation or not. The purpose of the present study is to investigate how young Japanese-speaking children comprehend negative sentences containing *dake* in the indirect object position as in (3), and examine whether children show a preference to either of the two interpretations and behave differently from adults.

2. The scope interaction with negation in child grammar

2.1. The preference for one reading and a cross-linguistic observation

A lot of previous research on children's comprehension of negative sentences that contain a quantifier has reported that young children often show difficulties in assigning inverse scope interpretations rather than surface scope interpretations (Musolino, 1998a, b; Musolino, et al. 2000; Lidz and Musolino, 2002). As for negative sentences containing *someone* and those containing *some* + N in the object position, Musolino (1998a) reports that two groups of English-speaking children (mean: 5;02 and 5;00 respectively) correctly accepted the inverse scope reading (QP > Neg) only 47% and 54% of the time respectively. More recent studies such as Gualmini (2005) and Gualmini et al. (2008), however, show experimentally that the rate of children's acceptance of the inverse scope reading much improves if the presentation of test sentences meets a certain felicity condition.

The question is whether there is still a preference for surface scope readings. Musolino and Lidz (2006) maintain Musolino's (1998b) original position that regards children's non-adult behavior as reflecting such a preference, and suggest that the preference may override the Principle of Charity in Crain and Thornton (1998), a preference for true interpretations. However they argue contra Musolino (1998a, b) and Musolino et al. (2000) that children can also access inverse scope interpretations when contextual support is given and the processing load was lowered, assuming that children differ from adults in their processing abilities. Following Hulsey et al. (2004), let us call this view 'Isomorphism by Default' (ID) in this paper. Hulsey et al. (2004), on the other hand, assume no preference for either of the two readings (see also Gualmini, 2007, 2008). They propose the Question-Answer Requirement (henceforth QAR), which assumes a bias toward accessing an interpretation that addresses the contextually relevant question. If such interpretations are multiple, children are expected to select a true interpretation.

The two hypotheses provide different predictions concerning children's interpretations of ambiguous sentences containing negation and another scope bearing element. Let us consider the case where young children are given such an ambiguous sentence under two different conditions where its surface scope or inverse scope reading becomes true. The ID hypothesis predicts that children, unlike adults, should reveal a preference for the surface scope reading to the extent that it is a default reading, that is, their first scope ambiguity resolution. Under the QAR hypothesis, on the other hand, children may accept both the surface

scope and the inverse scope reading as far as it entails a good answer (that is, can be YES or NO answers) to the contextually relevant question.

Although the two hypotheses are intended to account for children's non-adult behavior in the interpretation of a scope bearing element in negative sentences, more experimental studies would be necessary to see whether they can extend to languages other than English, or to a broader range of negative sentences. As for children's interpretation of negative sentences containing a numeral quantifier in the object position, Lidz and Musolino (2002) report that both English-speaking children and Kannada-speaking children faced difficulties in accessing inverse scope interpretations, although the two languages differ in the surface word order of the object and negation. This finding supports their view that the preference stems not from the surface word order between the two elements, but from their structural relation.

On the other hand, children speaking Japanese or Chinese seem not to face such a difficulty (Terunuma, 2001; Su, 2001). Terunuma's (2001) experimental results concerning the interpretation of the Japanese floating quantifier *zenbu* 'all' associated with an object were that the rates of acceptance of the surface scope reading by the younger group (age range: 3;10-4;07) and the older group (age range: 4;08-5;01) of children were 37.5% and 70.8% respectively, while those of the inverse scope reading were 95.8% and 100% respectively. These results indicate that the children found a difficulty in accessing not the inverse scope but the surface scope interpretation (without the support of the contrastive particle *wa* as in *zenbu-wa*). As for the test sentences she used, however, the rates of acceptance of the surface scope and inverse scope readings by the adult participants were 79.6% and 88.9% respectively. Thus, the adults may actually have shown a preference for the inverse scope over the surface scope reading. Similar results have been obtained concerning the interpretation of negative sentences containing *dake* in the object position. Noji (2011) reports that the mean proportion of the surface scope interpretations accepted by the child participants (mean age: 5;11) was .63, which was not so high, although the acceptance rate by the adults was .83 and this difference was not significant.

One possible reason for why Japanese-speaking children (and adults) did not easily access the surface scope reading in these studies is that the reading is usually given by the corresponding sentences with contrastive *wa*. If so, the difficulties found in Japanese-speaking children may have nothing to do with the presence or absence of the preference based on the structural relation of a scope bearing element with respect to negation.

The influence of *wa* can be lessened if *dake* is attached not to a direct object but to an indirect object as in (3). Thus, we focus in this paper on the previously unexamined construction to address the question of whether children speaking Japanese, which is an SOV language like Kannada where negation c-commands, but does not precede, the object, would show a preference for the surface scope reading as the ID hypothesis predicts, or a preference for the inverse scope reading as some previous studies on children speaking Japanese or Chinese report, or no preference between the two readings.

2.2. The felicity condition for negative sentences

The function of negative sentences is assumed to emphasize that what is expected is contrary to the actual result (Wason, 1965; Horn, 2001). One important previous finding concerning children's interpretation of negative sentences with an additional scope bearing element is that children often fail to access an interpretation if the presentation of a negative sentence does not meet such a pragmatic requirement (see Musolino and Lidz, 2006; Gualmini, 2005 among others). The method that Musolino and Lidz (2006) adopted to make negative sentences with *every* in the subject position easy to process was to add an affirmative sentence before them. They conducted an experiment using two kinds of test sentences such as (5a) and (5b) which minimally differed in that respect, and reported that 5-year-olds' acceptance of the inverse scope reading improved from 15% to 60% by using the method.

- (5) a. Every horse didn't jump over the fence.
b. Every horse jumped over the log but every horse didn't jump over the fence.

Gualmini et al. (2008) also report that manipulating a story so that a question such as (6a) becomes prominent enhanced children's (mean age: 4;08) acceptability of the inverse scope reading for a negative sentences such as (6b) up to 80%.

- (6) a. Was every letter delivered?
b. Every letter wasn't delivered.

To summarize section 2, we have seen first that it is still an open question whether Japanese-speaking children would reveal a preference for the surface scope reading, which can be attributed to the syntactic relation between negation and another scope bearing element, and secondly that negative sentences such as (3) can be good materials to approach the question anew. Furthermore, it has been experimentally found that a negative sentence becomes easy for young children to process if it is given in a pragmatically felicitous way, more specifically, after an affirmative sentence is presented overtly or saliently in the context.

3. Experiment I

3.1. Method

An experiment was designed to test children's accessibility of multiple readings of ambiguous negative sentences containing *dake* in the indirect object position. It was conducted with 21 Japanese-speaking children (10 boys and 11 girls) between the ages of 4;10 and 5;11 (mean: 5;04) and 18 native controls. The child participants were tested individually in a quiet room at a nursery school in Niigata, Japan. The adult participants were graduate and undergraduate students at a national university in Niigata, Japan. They were tested in small groups of 2 to 4 participants.

The current study employed the truth value judgment task (Crain and Thornton, 1998). After the short animal stories with the main character puppet (Winnie the Pooh or Minnie) and toy props, the puppet was given an affirmative question such as (7a) concerning its action in the story. The participants were asked to judge whether the puppet's statement presented as the answer (e.g., (7b)) was right (true) or not (false), and to explain the reason if they judged it not to be right².

- (7) a. Are Pooh-san, *pro* zou-san-dake-ni nuigurumi kashi-ta no?
Hey Pooh, *pro* elephant-only-to stuffed animal lend-PAST Q
'Hey Pooh! Did you lend the stuffed animal only to the elephant?'
b. U-u-n, *pro* zou-san-dake-ni *pro* kasite nai
No *pro* elephant-only-to *pro* lend-ASPECT not
'No, I have not lent it only to the elephant.'

The question and the target sentence in (7) were paired with a story where the main character lent a stuffed green caterpillar exclusively to one of three animals at the first three times, then loaned it to another, but not the third (see Appendix A for the complete script). The target sentence was true under the surface scope (but not inverse scope) reading when it was a statement concerning the first animal, that is, if the elephant in (7) was the first animal (Condition I). On the other hand, it became true under the inverse scope (but not surface scope) reading when it was a statement concerning the third animal (Condition II). The Condition I and Condition II sentences were also provided with prosodic information corresponding to the surface scope and the inverse scope interpretation respectively.

After two practice items, each participant was given nine semi-randomized test items which consisted of four target items (two for Condition I and two for Condition II), two items for *dake* control, and three fillers (see Appendix B for all the test sentences). The target items contain a negative sentence with *kasu* 'lend' or *kubaru* 'distribute' as the verb, and *dake* attached to the indirect object.

Since the test sentences are provided in two conditions where each of the surface scope and inverse scope reading becomes true, the ID hypothesis predicts that children would prefer the surface scope reading over the

inverse reading, and children should show more difficulty than adults in accepting Condition II sentences, but not Condition I sentences.

3.2. Results and Discussion

Out of 21 child participants, one could not complete the experiment, and two were considered as having not understood the task from the reasons they had given for their rejections. Results from the remaining 18 children (aged 4;10-5;11, mean: 5;04) who interpreted the *dake* control sentences correctly and 18 adults revealed high acceptance rates in both of the two conditions. The mean proportions (and standard deviations) of the surface scope and the inverse scope readings accepted by children were .78 (.30) and .78 (.42) respectively, while those by adults were .86 (.33) and .92 (.19) respectively. A 2 (age: children and adults) \times 2 (reading: surface and inverse) analysis of variance showed that the interaction between age and reading was not significant, $F(1, 34) = .12, ns$. There were no significant main effects of age nor reading either, $F(1, 34) = 2.14, ns$; $F(1, 34) = .12, ns$. These results indicate that children did not differ from adults in accessing the two readings of negative sentences with *dake*, nor did they show any preference between the two readings. Although three out of 18 children only accepted one reading, the reading was not limited to the surface scope reading, two accessing the surface scope reading and one the inverse scope reading.

These results do not accord with the prediction under the ID hypothesis. Before drawing a conclusion, however, we have to exclude the possibility that the children would have accepted the test sentences in any situation. To this end, a second experiment was designed to examine whether they can also correctly reject the test sentences in situations where each of the two readings becomes false.

4. Experiment II

4.1. Method

The truth value judgment task was administered again to the 18 child participants who could correctly judge *dake* control sentences in the first experiment, about a month after the first experiment.

The experiment consisted of two parts. In Part I, the participants were given two target sentences in situations where the surface scope reading became false, using the same question and lead-in as the first experiment (see (7a, b)). The sentences were also assigned prosodic information that corresponded to the surface scope reading as in the Condition I test sentences in the first experiment. They were paired with the story where the main character tries to lend or distribute something not only to one of the three animals but also to another, but he finally could not. The story minimally differed from that in the first experiment in that the main character finally lent or distributed something to only one of the three animals which was described in the test sentence (see Appendix C).

In Part II, the participants were provided with two kinds of situations where the inverse scope reading became true or false, with the target sentences introduced as in (8).

- (8) a Are Pooh-san, nuigurumi-wa dosi-ta no?
 Hey Pooh, stuffed animal-TOPIC do-with-PAST Q
 'Hey Pooh! What did you do with the stuffed animal?'
 b *pro* usagi-san-dake-ni *pro* kasite nai
pro rabbit-only-to *pro* lend-ASPECT not
 'I have not lent it only to the rabbit.'

The question sentence was changed from (7a) to (8a) to make (8b) easier to provide a good answer under the inverse scope reading. Also, the target sentences were assigned prosodic information corresponding to the inverse scope reading. One type of the story for (8) was essentially the same as the first experiment. It ended up with the situation where something was lent/distributed to two of three animals but not one. In this context, the target sentence (8b), which was given as a statement concerning the third animal, was expected to be true if the listener assigned it the inverse scope reading. The other type of the story concluded with

something being lent/distributed to the first animal, but not the second or third animal. This story itself is of the same type as used in Part I (see Appendix B). In this context, the target sentence (6b), which was a description of the third animal here again, was expected to be false under the inverse scope reading.

Part I included one practice item before the two test items, while Part II included one filler and randomized four test items that contained two kinds of stories. No time interval was placed between the two parts.

4.2. Results and Discussion

The results are given in Table 1 with part of the results from Experiment I repeated in brackets:

Table 1. Mean Proportions of Two Types of Readings Accepted by Children

Surface		Inverse	
True	False	True	False
[.78(.30)]	.00(.00)	.81(.08)	.08(.25)

Note: Standard deviations are in parentheses.

All the child participants correctly rejected the surface scope reading in the context where it was expected to be false. As for the inverse scope reading, the judgments and reasons that the children gave suggest that there were two children who did not access the reading at all, one of which showed the same results in the first experiment. However, the overall results in Table 1 indicate that they could correctly compute truth conditions associated with negative sentences with *dake*.

5. Conclusion

The present study revealed that young children were highly successful in accessing both of the surface and inverse scope readings of negative sentences with *dake* in the indirect object position, and that they showed no significant difference from adults in either reading.

Let us now consider several possibilities to explain the findings, including those that have been proposed in the previous literature. The first possibility is that the child participants would have accepted the sentences in any situation. This is readily excluded by the results from the second experiment: they could correctly reject the test sentences in two kinds of situations where they became false.

How about the possibility of being affected by the surface word order between negation and the focus particle? If the linear order were a key factor in children's scope resolution, *dake* in the indirect object would have taken scope over negation since the former precedes the latter in Japanese, and the children would have encountered a difficulty in accessing not the inverse scope but the surface scope. This prediction was not borne out, because our child participants showed high accessibility to the surface scope as well. Therefore, the present study suggests that the surface word order between negation and another scope bearing element is irrelevant to children's scope resolution, and confirms Lidz and Musolino's (2002) position although the rationale behind it is different.

A reverse problem arises if we pursue, along the line of the ID hypothesis in Musolino and Lidz (2006), the possibility that children's scope resolution primarily depends on the surface c-command relation between negation and the focus particle. Although it expects children's difficulty on the side of the inverse scope reading, our child participants did not show such a problem, which is consistent with a previous finding from Japanese-speaking children concerning the interpretation of negative sentences containing *zenbu* 'all' in Terunuma (2001). Thus, the ID hypothesis is not tenable.

The Japanese-speaking children's accessibility of multiple readings in this study can be best explained under such an approach as the QAR hypothesis that does not assume any preference between the two readings. Although the present study does not test the validity of the hypothesis, our overall results accord with it.

Finally, it should be noted that the satisfaction of the QAR does not necessarily guarantee children's

accessibility to multiple readings because some additional constraint may be at work. In fact, the QAR itself does not exclude the possibility that some syntactic constraint would also operate. As for the inverse scope reading of negative sentences with *dake* in the subject position, Noji (2011) reports that Japanese-speaking children (mean: 5;11) correctly rejected it, the mean rate of acceptances being .31. It would be implausible that children come to know the unavailability of the reading on the basis of input. The difference in children's accessibility of the inverse scope reading between in the subject+*dake* sentences and in the (indirect) object+*dake* sentences may be given a syntactic explanation just as in adult grammar. Thus, the QAR hypothesis is compatible with this kind of previous finding as well, and the question of how the syntactic relation between a scope bearing element and negation is involved in children's interpretation should continue to be explored in future research.

Notes

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¹ The following abbreviations will be adopted in this paper. ACC: accusative, DAT: dative, NOM: nominative.

² Adult participants indicated their judgments on a score sheet.

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Appendix A: Sample script in Experiment I (translated into English)

Winnie the Pooh (says pointing to something in a bag): Guess what this is? It's a stuffed green caterpillar. Who am I going to lend it to? My sweet elephant, here you go.
Squirrel: Me too! /Pig: Me too! /Elephant: Me too!
Winnie the Pooh: Elephant, you too? Here it is. Once more? Here it is.
Squirrel and Pig: That's not fair. That's not fair.
Pig got angry and went somewhere.
Squirrel: I want to touch that too. Me too!
Winnie the Pooh: Well, no way...Squirrel, here you go.

Appendix B: List of all the test sentences in the order of presentation in Experiment I

1. *pro zousan-dake-ni pro age-ta.* (Control, T)
'I gave it only to the elephant.'
2. U-u-n, *pro zou-san-dake-ni pro kasi-te nai.* (Surface, T)
'No, I have not lent it only to the elephant.'
3. *pro nekosan-dake-ni pro age-ta.* (Control, F)
'I gave it only to the cat.'
4. U-u-n, *pro butasan-dake-ni pro kubat-te nai.* (Surface, T)
'No, I have not lent it only to the elephant.'
5. *pro Minna-ni pro age-ta yo.* (Filler, F)
'I gave it to everyone.'
6. U-u-n, *pro ahirusan-dake-ni pro kubat-te nai.* (Inverse, T)
'No, I have not lent it only to the duck.'
7. *pro mada ahirusan -ni pro age-te nai.* (Filler, F)
'I have not given it to the elephant yet.'
8. U-u-n, *pro ahirusan-dake-ni pro kasi-te nai.* (Inverse, T)
'No, I have not lent it only to the duck.'

Appendix C: Sample script in Experiment II (translated into English)

Winnie the Pooh (says pointing to something in a bag): Guess what this is? It's a stuffed green caterpillar. Who am I going to lend it to? My sweet elephant, here you go.
Squirrel: Me too! /Pig: Me too! /Elephant: Me too!
Winnie the Pooh: Elephant, you too? Here it is. Once more? Here it is.
Squirrel and Pig: That's not fair. That's not fair.
Squirrel: I want to touch it too. Me too!
Winnie the Pooh: Let's see, ...Excuse me, Squirrel and Pig. Since I don't want it to get dirty, that's all for today.
Squirrel and Pig got angry and went somewhere.