

Children's Understanding of the Universal Quantifier *WH+mo* in Japanese *

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1. Introduction

In this paper, I will report the results of an experiment on children's understanding of a universal quantifier in Japanese. Some quantifiers in Japanese are expressed by a wh-word with a particle. Because of that, wh-words in Japanese are called indeterminate pronominals (Kuroda 1965). A universal quantifier which corresponds to *every* is expressed with a wh-word with a focus particle *mo* (henceforth *WH+mo*). *WH+mo* appears not only in a declarative sentence as shown in (1a) but also in a negative sentence as in (1b):

- (1) a. dare-mo-ga naita.
who-mo-Nom cried
"Everyone cried."
b. dare-mo nakanakatta.¹
who-mo cried-Neg
"No one cried."

When *WH+mo* appears in a negative sentence, it has a meaning close to a negative polarity item (NPI) *any*, but it has been proposed that *WH+mo* is a negative concord item (NCI), not a NPI, on the basis of its behavior. (Watanabe (2002)).

Because the form of *WH+mo* and that of a wh-phrase are quite similar, I expect that it is difficult for children to acquire the meaning of *WH+mo* as a quantifier. More specifically, I conducted an experiment to find answers for the following three basic questions: (i) Do Japanese children understand *WH+mo* as universal quantifiers (UQs)? (ii) Do children treat *WH+mo* without negation (i.e. *every*) and *WH+mo* with negation (i.e. *any*) in the same way? (iii) Do children misunderstand *WH+mo* as a wh-phrase? If children misunderstand *WH+mo* as a wh-phrase, it is possible that children ignore the focus particle *mo* when they interpret *WH+mo*.

Based on the results of the experiment, I will show that children often understand *WH+mo* as a quantifier correctly, particularly when it is with negation at an early stage in the course of language acquisition. On the other hand, children tend to misinterpret *WH+mo* as a

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¹ There are differences between *WH+mo* in an affirmative sentence and a negative sentence with regard to the case marker and the pitch. I deal with those issues in detail in section 3.

wh-phrase when it is without negation.

The organization of this paper is as follows. I will explain the details of the experimental design in section 2. I will present the results in section 3 and discuss the difference between children's understanding of *WH+mo* with and without negation in section 4. Section 5 is the conclusion.

2. Experiment

The subjects were 30 monolingual Japanese children from 3;6 to 6;7. The numbers of each age group are shown in the table below:

(2) Table 1: The number of subjects in each age group

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
#	7	7	9	7

Each child was interviewed in a nursery school room in Yokohama, Japan. The experiment took approximately 15 minutes for each child.

The method I used was the Yes/No Judgment Task. Children were told 10 short stories which were acted out with small dolls by the experimenter. At the end of each story, they were asked one yes/no question containing *WH+mo* related to the story. The reason for choosing this task and asking children yes/no questions is that yes/no questions are also felicitous in the contexts to children who misinterpret *WH+mo* as a wh-phrase. Those children were supposed to think that they were asked a wh-question. In Japanese wh-questions, wh-phrases are in-situ, so children cannot tell whether the question is a yes/no question or a wh-question from its word order. In both yes/no questions and wh-questions, a question particle *ka/kana/no* is attached at the end of a question. Both questions have rising intonation, but no overt operations like subject-auxiliary inversion occur.

The stories were carefully constructed so that children could give felicitous answers even if they misinterpret *WH+mo* as a wh-phrase. One of the stories and a test question are given below:

(3) A bear, a goose and a frog were taking a walk. There was a stone hidden in a bush. The bear didn't notice the stone and fell. "Oh, it hurts so much!" The bear cried. (The experimenter attaches pictures of tears to the bear's eyes.) The goose and the frog noticed, "Oh, there is a stone!" So the goose and the frog did not fall.

Test Question: Dare-mo nakanakatta kana?

Who-mo cried-Neg Q

"Didn't anyone cry?"

As for the answer for (3), children who understand *WH+mo* as a quantifier correctly should respond, "Yes, the bear cried." In contrast, children who misunderstand *WH+mo* as a wh-phrase should interpret *dare-mo* (who-mo, i.e. *every*) as *dare-ga* (who-Nom, i.e. *who*) and they should give an answer like "The goose and the frog didn't cry," since they would try to

answer with the animals who did not cry.

There were two types of test questions: the first type included four yes/no questions involving *WH+mo* without negation, and the second type included six yes/no questions involving *WH+mo* with negation. The reason for having those two types is to examine whether children treat those two types (i.e. *WH+mo* without or with negation) differently. Each type contained different kinds of wh-words such as *dare* (who), *dono-dobutsu* (which animal) and *nani* (what). Two questions which are matched and mismatched to the contexts were included for all kinds of test questions, so the correct answers include both “yes” and “no”, and we can check whether children have a yes-bias or not. Examples of the two types are shown in (4):

(4) Types of Test Questions

Type 1: *WH+mo* without negation (4 questions)

- a. Dare-mo-ga / Dono-dobutsu-mo naita kana?
Who-mo-Nom/Which-animal-mo cried Q
“Did everyone / every animal cry?”

Type 2: *WH+mo* with negation (6 questions)

- b. Dare-mo / Dono-dobutsu-mo nakanakatta kana?
Who-mo / which-animal-mo cried-Neg Q
“Didn’t anyone / any animal cry?”
- c. Usagi-san-wa nani-mo toranakatta kana? ²
Rabbit-Polite-Top what-mo took-Neg Q
“Didn’t the rabbit take anything?”

In addition to the ten questions containing *WH+mo*, children were asked 3 wh-questions, 2 questions in which *WH* and the particle *mo* were separated and 2 practice questions in the same experiment. The actual questions and the results of them were given in the Appendix.

3. Results

The results are given in the tables below. The tables show the percentages of correct responses and incorrect responses in which *WH+mo* was misanalyzed as a wh-phrase (henceforth “misanalyzed responses”). The numbers in the brackets below the percentages show the numbers of correct responses and those of misanalyzed responses out of effective answers. The number of the effective answers differs in each age group, because the number of the subjects differs and the ambiguous or unclear answers have been excluded from the counts.

² *Nani-mo* is used only with negation. It cannot appear in an affirmative sentence.

(5) Table 2: *WH+mo* without negation (Type 1)

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Correct Responses	7.1% (2/28)	11.5% (3/26)	50.0% (15/30)	76.0% (19/25)
Misanalyzed as wh	85.7% (24/28)	80.8% (21/26)	50.0% (15/30)	24.0% (6/25)

(6) Table 3: *WH+mo* with negation (Type 2)

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Correct Responses	70.7% (29/41)	66.7% (28/42)	81.3% (39/48)	97.5% (39/40)
Misanalyzed as wh	26.8% (11/41)	28.6% (12/42)	16.7% (8/48)	2.5% (1/40)

Table 2 gives the results of the understanding of *WH+mo* without negation (i.e. *every*) (Type 1). As for three and four-year-olds, the percentages of correct responses are quite low, i.e., 7.1% and 11.5%, whereas the percentages of misanalyzed responses were quite high, 85.7% and 80.8%. This shows that three and four-year-old children tend to misinterpret *WH+mo* as a wh-phrase when *WH+mo* appears without negation. The rate of correct responses of five-year-olds is 50%, still not so high, and that of six-year-olds finally rising to 76%. In other words, when *WH+mo* appears in a yes/no test question without negation, we find that children tend to misinterpret *WH+mo* as a wh-phrase.

Table 3 gives the results of the understanding of *WH+mo* with negation (i.e. *any*) (Type 2). In contrast to the understanding of *WH+mo* without negation (*every*), even three and four-year-olds did quite well with *WH+mo* with negation (*any*). The percentages of their correct responses are 70.7% and 66.7%, being quite different from those in Table 2. Five and six-year-old children answered almost perfectly, the percentages of their correct responses being 81.3% and 97.5%. The results in Table 3 show us that children as young as three year old have already acquired that *WH+mo* (*any*) is a quantifier, not a wh-phrase, when it appears with negation.

Our overall results show that children seemed to understand the meaning of *WH+mo* correctly as a quantifier at an early stage, particularly when *WH+mo* appears with negation (*any*). The results also suggest that children are not dropping the particle *mo* when they understand *WH+mo*.

If we look at the percentages of correct responses for each lexical item, however, the percentages are actually quite different depending on the lexical items as shown in Table 4 and 5.

(7) Table 4: Percentages of correct responses for each lexical item

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
dare-mo-ga UQ	0.0%	7.7%	42.9%	81.8%
who-mo-Nom (everyone)	(0/14)	(1/13)	(6/14)	(9/11)
dono-NP-mo UQ	14.3%	23.1%	56.3%	71.4%
which-NP-mo (every NP)	(2/14)	(3/13)	(9/16)	(10/14)
dare-mo NCI	78.6%	78.6%	87.5%	100%
who-mo (anyone + Neg)	(11/14)	(11/14)	(14/16)	(14/14)
dono-NP-mo NCI	30.8%	28.6%	50.0%	91.7%
which-NP-mo (any NP+Neg)	(4/13)	(4/14)	(7/14)	(11/12)
nani-mo NCI	100%	92.9%	100%	100%
what-mo (anything + Neg)	(14/14)	(13/14)	(18/18)	(14/14)

(UQ = universal quantifier, NCI = negative concord item)

(8) Table 5: Percentages of misanalyzed as wh for each lexical item

	3-year-olds	4-year-olds	5-year-olds	6-year-olds
dare-mo-ga UQ	100%	92.3%	57.1%	18.2%
who-mo-Nom (everyone)	(14/14)	(12/13)	(8/14)	(2/11)
dono-NP-mo UQ	71.4%	69.2%	43.8%	28.6%
which-NP-mo (every NP)	(10/14)	(9/13)	(7/16)	(4/14)
dare-mo NCI	14.3%	21.4%	12.5%	0.0%
who-mo (anyone + Neg)	(2/14)	(3/14)	(2/16)	(0/14)
dono-NP-mo NCI	69.2%	57.1%	42.9%	8.3%
which-NP-mo (any NP+Neg)	(9/13)	(8/14)	(6/14)	(1/12)
nani-mo NCI	0.0%	7.1%	0.0%	0.0%
what-mo (anything + Neg)	(0/14)	(1/14)	(0/18)	(0/14)

Table 4 shows the percentages of correct responses for each lexical item and Table 5 shows the percentages of misanalyzing quantifiers as wh-phrases for each lexical item. As shown in Table 4, even 3-year-old children seem to understand the negative concord items (NCIs) *dare-mo* (anyone) and *nani-mo* (anything) correctly as quantifiers most of the time, although the percentages for other quantifiers are low. In Table 5, the first two rows show that the percentages of the misanalysis by 3 to 5-year-olds are quite high for *dare-mo-ga* (everyone) and *dono-NP-mo* (every NP). In contrast, the percentages of misanalyzing NCIs such as *dare-mo* (anyone) and *nani-mo* (anything) are quite low, but the rate is high again for *dono-NP-mo* (any NP) with negation.

In summary, even 3-year-old children seem to understand some negative concord items, that is, *dare-mo* (anyone) and *nani-mo* (anything), as quantifiers correctly. This suggests that they do not disregard the case particle *mo* when they interpret the quantifiers. Children, however, tend to misinterpret some quantifiers as wh-phrases: they are *dare-mo-ga* (everyone), *dono-NP-mo* (every NP), and *dono-NP-mo* (any NP) with negation.

Why are there such differences depending on the lexical items? Actually there are differences regarding case-marking and their pitch among those lexical items. Let us first look at *dare-mo* (everyone) and *dare-mo* (anyone) with negation. As shown in (1a) and (1b), repeated here as (9a) and (9b), *dare-mo* (everyone) in an affirmative sentence needs to have

the nominative case marker *-ga* when it appears in the subject position, but the case marker is not attached when *dare-mo* (anyone) is used with negation:

- (9) a. *dare-mo-ga naita.*
who-mo-Nom cried
“Everyone cried.”
b. *dare-mo nakanakatta.*
who-mo cried-Neg
“No one cried.”
c. *dare-ga naita kana?*
who-Nom cried Q
“Who cried?”

The nominative case marker *-ga* can also be used with a wh-phrase as *dare-ga* (who-Nom) as shown in (9c). Thus, the presence of the case marker in *dare-mo-ga* (everyone-Nom) makes it quite similar to the wh-phrase *dare-ga* (who-Nom), and perhaps this can be one of the causes of confusing *dare-mo-ga* (everyone) with the wh-phrase *dare-ga* (who-Nom) for children.

Furthermore, there are pitch differences. The first mora *da* in *dare-mo-ga* (everyone) is associated with high pitch in an affirmative sentence, which is the same pattern as a wh-phrase in a wh-question (i.e., *da* in *dare-ga* (who-Nom)). In contrast, the second and the third mora in *dare-mo* (anyone), that is, *re* and *mo*, and *nani-mo* (anything), that is, *ni* and *mo*, have high pitch in negative sentences. This difference is consistent among native speakers of Japanese. Since the pitch patterns of *dare-mo* (anyone) and *nani-mo* (anything) in negative sentences are different from those of wh-phrases, unlike *dare-mo-ga* (Everyone-Nom) in an affirmative sentence, it may be easier for children to identify *dare-mo* (anyone) and *nani-mo* (anything) as quantifiers correctly, not as wh-phrases. On the other hand, children may tend to misinterpret *dare-mo-ga* (everyone) as *dare-ga* (who-Nom) because of the same pitch pattern.

Now we turn to *dono-NP-mo* (every NP) and *dono-NP-mo* (any NP) with negation. Unlike *dare-mo* (everyone), the nominative case marker *-ga* cannot be attached to either. As for the pitch, there is usually no phonological difference in the Kanto (the eastern part of Japan) dialect: first mora *do* in *dono-NP-mo* (every NP) and *dono-NP-mo* (any NP) always has high pitch. Their pitch patterns are the same as that of a wh-phrase *dono-NP-ga* (which NP-Nom). Some people who speak the Kansai (the western part of Japan) dialect say that there is a difference between the two, but I used the same pitch pattern for both *dono-NP-mo* (every NP) and *dono-NP-mo* (any NP) in my experiment. Since their pitch patterns are the same as that of a wh-phrase, it is possible for children to misunderstand both *dono-NP-mo* (every NP) and *dono-NP-mo* (any NP) as the wh-phrase *dono-NP-ga* (which NP).

To summarize, the results show that children understand some negative concord items such as *dare-mo* (anyone) and *nani-mo* (anything) as quantifiers correctly at an early stage in the course of their language acquisition, but children tend to misinterpret some quantifiers such as *dare-mo* (everyone), *dono-NP-mo* (every NP) and *dono-NP-mo* (any NP) as wh-phrases.

4. Discussion

Before discussing what can be suggested from the results, I briefly explain why Watanabe (2002) claims that *WH+mo* in a negative sentence is a negative concord item (NCI), not a negative polarity item (NPI). What is a negative concord item? It is said to be used 'in situations where negation is interpreted just once although it seems to be expressed more than once in the clause.' (Giannakidou (2000)) NCIs exist in many languages such as West Flemish (Haegeman and Zanuttini (1996)), Italian and Greek (Giannakidou (2000)). Words which are highlighted are NCIs in the following examples:

- (10) a. ..da Valère **niemand** nie (en)-kent.
that Valère nobody notNeg know
“..that Valère doesn't know anybody.”(West Flemish; Haegeman and Zanuttini (1996))
- b. Gianni non ha visto **niente**.
John not have.3sg see nothing.
“John didn't see anything.” (Italian; Giannakidou (2000))
- c. Dhen ipa **TIPOTA** (stressed).
not said.1sg nothing
“I didn't say anything.” (Greek; Giannakidou (2000))

According to Watanabe (2002), there are at least 5 diagnostics to distinguish NPIs and NCIs, including Valluví's (1994) four diagnostics, as listed in (11):

- (11) i. NPIs can appear in non-negative contexts (yes/no Q, conditionals), but NCIs cannot.
ii. NPIs must be c-commanded by the Neg head, and thus NPIs cannot appear beyond NegP. In contrast, NCIs can appear in the subject position, beyond NegP.
iii. NPIs cannot be modified by expressions like “almost”, but NCIs can.
iv. NPIs cannot be used as an elliptical answer, but NCIs can be, so NCIs are considered to be inherently negative.
v. NPIs can be licensed across an indicative clause boundary, but NCIs cannot.

Now let us see whether *WH+mo* behaves like NCIs, not NPIs. The following explanations and examples are from Watanabe (2002). First, NPIs can appear in non-negative contexts such as yes/no questions and conditionals as shown in (12a) and (12b), but *WH+mo* cannot as in (12c) and (12d):

- (12) a. Have you seen **anything**?
b. If John steals **anything**, he'll be arrested.
c. * **Nani-mo** mimashita ka?
what-mo see-Polite-Past Q
d. * John-ga (moshi) **nani-mo** nusundara, taihosareru daroo.
John-Nom if what-mo steal-Cond arrest-Passive be-will

Second, NPIs cannot appear in the subject position as in (13a), but *WH+mo* can as shown in (13b):

- (13) a. ***Anybody** didn't criticize John.
 b. **Dare-mo** John-o hihanshinakatta.
 who-mo John-Acc criticize-Neg-Past
 "No one criticized John."

Third, NPIs cannot be modified by expressions like "almost", but *WH+mo* can be:

- (14) a. *John didn't eat almost **anything**.
 b. John-wa hotondo **nani-mo** tabenakatta.
 John-Topic almost what-mo eat-Neg-Past
 "John ate almost nothing."

Fourth, NPIs cannot be used as an elliptical answer, but *WH+mo* can be:

- (15) a. Q: What did you see?
 A: ***Anything**.
 b. Q: Nani-o mita no?
 what-Acc saw Q
 "What did you see?"
 A: **Nani-mo**.
 what-mo
 "Nothing."

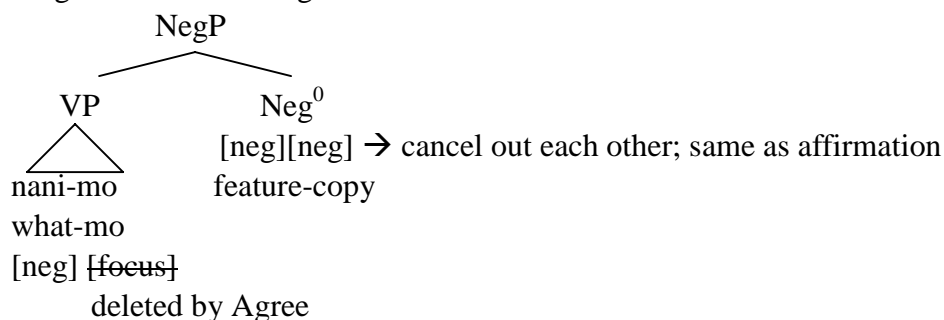
Finally, NPIs can be licensed across an indicative clause boundary, but *WH+mo* cannot:

- (16) a. I didn't say that John admired **anyone**.
 b. ?* Boku-wa [John-ga **dare-mo** sonkeishiteiru to] iwanakatta.
 I-Topic John-Nom who-mo admire C⁰ say-Neg-Past.

Based on the differences between NPIs and *WH+mo* and the common characteristics of NCIs and *WH+mo*, Watanabe claims that *WH+mo* is a NCI, not a NPI. I assume that Watanabe's (2002) argument is correct and that *WH+mo* is a NCI when it is with negation.

Let us go back to the results of the experiment. In section 3, we have seen that the NCIs such as *dare-mo* (anyone) and *nani-mo* (anything) are understood correctly as quantifiers by children at an early stage. Based on the results, I would like to suggest that children are sensitive to the licensing mechanism of negative concord from an early stage in the course of their language acquisition. The licensing mechanism of negative concord proposed by Watanabe (2002) is shown in (17):

(17) Licensing mechanism of negative concord

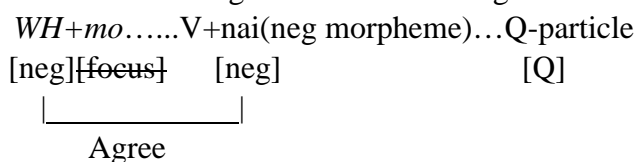


In (17), *WH+mo* in VP is considered to have an uninterpretable focus feature and a [neg] feature inherently, since it can be used as an elliptical answer as we have seen in (15). The [neg] feature of *WH+mo* is related to the [neg] feature of the head of NegP. More specifically, the [neg] feature of *WH+mo* is copied to Neg⁰ by feature copying, and since Neg⁰ has two [neg] features which are not hierarchically ordered, the two [neg] features cancel out each other and it means the same as affirmation. Namely, only the [neg] feature of *WH+mo* remains. If Watanabe’s hypothesis is on the right track, it means that children are sensitive to this licensing mechanism of *WH+mo* as a negative concord item quite early.

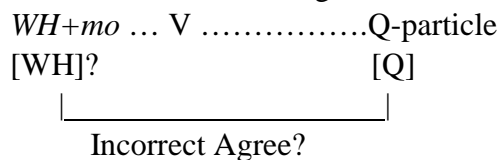
As we have seen in section 3, children tend to misinterpret *WH+mo* as a wh-phrase when it is in an affirmative sentence. Thus, children may acquire *WH+mo* as a negative concord item first, and then they may move onto the acquisition of *WH+mo* as a universal quantifier in an affirmative sentence. It is still not clear, however, why children can understand *WH+mo* as a negative concord item correctly (except for *dono-NP-mo* (anything)) and why they tend to misinterpret *WH+mo* as a wh-phrase when it is in an affirmative sentence.

Let us consider the two cases in the diagrams shown below:

(18) a. Children’s licensing of *WH+mo* as a negative concord item



b. Children’s misunderstanding of *WH+mo* as a wh-phrase



When *WH+mo* is in a negative sentence, children seem to know its licensing mechanism. As shown in (18a), *WH+mo* has an inherent [neg] feature and an uninterpretable [focus] feature. The [focus] feature triggers the checking between the [neg] feature of *WH+mo* and the [neg] feature of Neg⁰ by the Agree operation. Since the [neg] feature of Neg⁰ is between *WH+mo* and Q-particle, it seems that this [neg] feature blocks the incorrect connection between *WH+mo* and the Q-particle at the end of the question. As you can see, Neg⁰ is closer to *WH+mo* than the Q-particle in (18a). In contrast, as shown in (18b), when *WH+mo* is in an affirmative sentence, there is no NegP and there is nothing which checks the features of

WH+mo between *WH+mo* and the Q-particle. Therefore, it is possible that children connect *WH+mo* and the Q-particle incorrectly and interpret *WH+mo* as a wh-phrase.

5. Conclusion

In this paper, I have presented the results of my experiment which examined children's understanding of the quantifier *WH+mo* in Japanese. The results have shown that children understand *WH+mo* with negation much better than *WH+mo* without negation, although the acquisition of *WH+mo* seems to be done item by item. I have suggested that children are sensitive to the licensing of negative concord at an early stage in the course of their language acquisition, and children may start the acquisition of *WH+mo* as a negative concord item.

Appendix

3 wh-questions included in the experiment are those with negation in (i). The results are shown in Table A.

- (i) a. dare-ga nakanakatta kana?
 who-Nom cried-Neg Q
 "Who didn't cry?"
- b. dono-doubutsu-ga suberanakatta kana?
 which-animal-Nom slid-Neg Q
 "Which animal didn't slide?"
- c. usagisan-wa nani-wo toranakatta kana?
 rabbit-Topic what-Acc took-Neg Q
 "What didn't the rabbit take?"

<Table A> WH with negation

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Correct Responses	90.5% (19/21)	100% (21/21)	96.3% (26/27)	100% (15/15)

The children understood the wh-questions almost perfectly. This means that children were not making mistakes with *WH+mo* due to the late acquisition of wh-questions.

We also included two questions in which WH and *mo* were separated. The test sentences we used can be seen in (ii):

- (ii) a. kumasan-wa **dare**-ga koronde-**mo** tasuketa kana?
 bear-Topic who-Nom fall-mo helped Q
 "Did the bear help everyone who has fallen?"
- b. kumasan-wa **dare**-ga koronde-**mo** tasukenakatta kana?
 bear-Topic who-Nom fall-mo helped-Neg Q
 "Didn't the bear help anyone who has fallen?"

In adult speech, it is possible to have WH and *mo* separated. WH and *mo* still have the meaning of a quantifier as a set, although it is not clear whether the separated WH and *mo*

have exactly the same meaning as *WH+mo*. The results shown in Table B below have revealed that such structures in (ii) are still difficult for five-year-old children to understand.

<Table B> *WH...mo*

Age	3-year-olds	4-year-olds	5-year-olds	6-year-olds
Correct Responses	23.1% (3/13)	14.3% (2/14)	47.1% (8/17)	84.7% (11/13)
Misanalyzed as wh	61.5% (8/13)	78.6% (11/14)	35.3% (6/17)	15.4% (2/13)

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