Children's Interpretations of *Some/every* Interaction in Mono-clausal and Bi-clausal Structures in Japanese

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1. Introduction

This paper examines the acquisition of quantifier scope interactions between *some* and *every* in Japanese. When *some* and *every* are both in a mono-clausal structure like 'Someone loves everyone', both surface and inverse scope readings are possible in English, but Japanese allows only a surface scope reading except in certain cases. It is said that this is due to the Rigidity Condition (Lasnik and Saito 1992). It has been reported that Japanese children's interpretations for mono-clausal *some/every* interaction are more like those of English in that they accept inverse scope readings (Sano 2004). Studies regarding the acquisition of scope interaction between negation and quantifiers in English (Musolino 1998a, 1998b, Musolino, Crain and Thornton 2000) suggest that young children, unlike adults, systematically interpret negation and quantifiers on the basis of their surface position (i.e., the observation of Isomorphism.) In the case of *some/every* interaction in Japanese mono-clausal structures (Sano 2004), children's interpretations seem to be the reverse of Isomorphism: they accept inverse scope readings, in contrast to Japanese adults.

In addition to mono-clausal structures, we will examine Japanese children's interpretations of *some/every* interaction in bi-clausal structures. Contrary to mono-clausal structures, when *some* and *every* are in a different finite clause in a bi-clause structure such as 'Someone thinks that everyone bought a book', the adults' interpretation of the sentence is unambiguous both in English and Japanese and only a surface scope reading is possible. It has been proposed that this is due to the clause-bound property of Quantifier Raising (Williams 1986, Lasnik and Saito 1992.) If Japanese children take the English option in that they reject inverse scope readings for bi-clausal structures, the Weak Continuity Hypothesis (Weissenborn, Goodluck and Roeper 1992) can explain the acquisition of *some/every* interaction in Japanese. We will report the results of our experiment to investigate whether this prediction is borne out. We will also discuss Isomorphism, the acquisition of the Rigidity Condition and the clause-bound property of Quantifier Raising.

2. *Some/every* interaction in mono-clausal and bi-clausal structures

2.1. English

When *some* and *every* are in a mono-clausal structure as in (1), the sentence is ambiguous and it has two interpretations shown in (2) (May 1977, 1985, Aoun and Li 1993, Hornstein 1995):

(1) Someone loves everyone. (^{ok}some>every, ^{ok}every>some)
(2) a. There is some x, such that for every y, it is the case that x loves y. (some > every)
b. For every y, there is some x such that it is the case that x loves y. (every > some)

(2a) is the case in which one individual loves all the people, and it is said that the quantifier *some* takes wide scope over the quantifier *every*. This is called a surface scope reading, since it keeps the surface order of *some* and *every* in (1). (2b) is the case in which each person may be loved by someone different. In this case, it is said that quantifier *every* takes wide scope over *some*. This is called an inverse scope reading since the scope

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taking order is the inverse of the surface order of *some* and *every*. It has been generally assumed that (1) is ambiguous because the LF representations (3) are possible:

(3) a. [$_{IP}$ someone$_1$ [$_{IP}$ everyone$_2$ [$_{IP}$ t_1 loves t_2.]]] (some > every)
b. [$_{IP}$ everyone$_2$ [$_{IP}$ someone$_1$ [$_{IP}$ t_1 loves t_2.]]] (every > some)

In (3), both *someone* and *everyone* are raised to IP adjoined positions by Quantifier Raising (QR). In (3a), *someone* is raised higher than *everyone* and *someone* takes wide scope over *everyone*. In (3b), *everyone* is raised higher than *someone* and *everyone* takes wide scope over *someone*.

When *some* and *every* are in a different finite clause in a bi-clausal structure as in (4), it has been pointed out that it is not ambiguous[1] (Williams 1986):

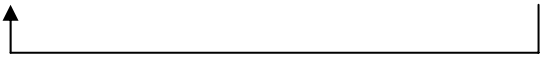
(4) Someone thinks that everyone bought a book. (^{ok}some > every, * every > some)

As for the interpretation of (4), (5a) is possible, but (5b) is not:

(5) a. ^{ok} There is some x, such that for every y, x thinks that y bought a book. (some>every)
b. * For every y, there is some x such that x thinks that y bought a book. (every>some)

(5) shows that *some* can take wide scope over *every*, but not vice versa. This fact suggests that *every* cannot be raised higher than *some* by QR at LF as in (6) and that QR is clause-bound (Lasnik and Saito 1992):

(6) * [$_{IP1}$ everyone$_2$ [$_{IP1}$ someone$_1$ [$_{IP1}$ t_1 thinks [$_{CP}$ that [$_{IP2}$ t_2 bought a book.]]]]]



* Quantifier Raising out of the embedded clause

In the next section, we examine *some/every* interaction in mono-clausal and bi-clausal structures in Japanese.

2.2. Japanese

Let us consider the case where *some* and *every* are in a mono-clausal structure in Japanese:

(7) Dareka-ga daremo-o aisiteiru. (^{ok}some > every, * every > some)
someone-Nom everyone-Acc loves
'Someone loves everyone.'

Let us call (7) 'a canonical mono-clausal structure' since it has a canonical word order, SOV. In (7), contrary to English, only *someone* can take wide scope over *everyone* (i.e., surface scope reading), not vice versa (i.e., inverse scope reading) (Kuroda 1970). Lasnik and Saito (1992) explain the non-availability of an inverse scope reading by the Rigidity Condition stated in (8):

(8) Rigidity Condition
Suppose that Q_1 and Q_2 are operators (quantified NP or WH). Then, Q_1 cannot take wide scope over Q_2 If t_2 c-commands t_1. (Lasnik and Saito 1992)

[1] Johnson (2000) points out that an inverse scope reading is possible when an embedded clause is nonfinite:
(i) Someone wanted to visit everyone. (^{ok}some > every, ^{ok}every > some)

The LF representation of (7) is represented as in (9):

(9) [$_{IP}$ dareka$_1$ [$_{IP}$ daremo$_2$ [$_{IP}$ t_1 t_2 aisiteiru]]]
someone everyone loves
'Someone loves everyone.'

In (9), t_1 asymmetrically c-commands t_2 , so *dareka* (someone; Q_1) can take wide scope over *daremo* (everyone; Q_2), but *daremo* (Q_2) cannot take wide scope over *dareka* (Q_1).[2]

When *daremo-o* (everyone-Acc) is scrambled to the position higher than *dareka* (someone) as in (10), the sentence becomes ambiguous:

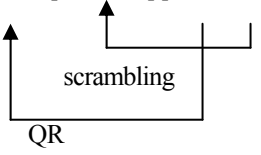
(10) Daremo-o$_i$ dareka-ga t_i aisiteiru. (^{ok}some > every, ^{ok}every > some)
everyone-Acc someone-Nom loves
'Everyone, someone loves.'

Let us call (10) 'a scrambled mono-clausal structure.' Both the surface scope reading and the inverse scope reading become possible in (10) as shown in (11):

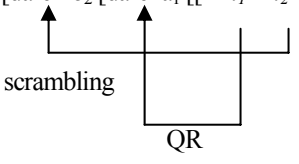
(11) a. There is some x, such that for every y, it is the case that x loves y. (some > every)
b. For every y, there is some x such that it is the case that x loves y. (every > some)

Why does the inverse scope reading (11b) become possible when *daremo-o* (everyone-Acc) is scrambled? Consider the LF representations of (10) shown in (12):

(12) a. [dareka$_1$ [daremo$_2$ [[t_1 t_2 aisiteiru]]]] (some > every)



b. [daremo$_2$ [dareka$_1$ [[t_1 t_2 aisiteiru]]]] (every > some)



(12a) does not violate the Rigidity Condition, whereas (12b) seems to be a problem. In (12b), the trace of

[2] In fact, the sentence corresponding to (7) in English, 'Someone loves everyone', seems to be a problem. The sentence does allow an inverse scope reading, which is stated as follows: For every y, there is some x such that x loves y. The LF representation in (i) for the inverse scope reading, however, violates the Rigidity Condition:
(i) [everyone$_2$ [someone$_1$ [t_1 loves t_2]]]
In (i), the trace of *someone,* t_1, asymmetrically c-commands the trace of *everyone,* t_2. Thus, according to the Rigidity Condition, *everyone* should not be able to take wide scope over *someone* and the inverse scope reading should not be possible, but in fact the inverse scope reading is acceptable. Lasnik and Saito (1992) note that the preferred reading for (i) is the surface scope reading, not the inverse scope reading whose LF representation violates the Rigidity Condition. Furthermore, they point out that certain other existential quantifiers strictly obey the Rigidity Condition as shown in (ii):
(ii) Some woman loves everyone.
Lasnik and Saito (1992) argue that in (ii) the surface scope reading is strongly preferred, and that they can maintain the Rigidity Condition.

dareka (someone), t_1, asymmetrically c-commands the trace of *daremo* (everyone), t_2 and *daremo* (everyone) should not be able to take wide scope over *dareka* (someone) due to the Rigidity Condition. However, *daremo* (everyone) can take wide scope over *dareka* (someone) and the interpretation (11b) is possible.

To solve this problem, Murasugi and Saito (1992) argue that only variables are subject to the Rigidity Condition. In (12b), the trace of *daremo-o* (everyone-Acc), t_2, is a trace of clause-internal scrambling, which has been said to have properties of A and A'-movement (Mahajan 1990, Saito 1992, Tada 1993). Since the trace of the scrambling of *daremo-o* (everyone-Acc), t_2, can be an NP-trace in (12b), not a variable, it is not subject to the Rigidity Condition. Therefore, according to Murasugi and Saito (1992), (12b) does not violate the Rigidity condition, and thus *daremo* (everyone) can take wide scope over *dareka* (someone).

Next we look at *some* and *every* in a bi-clausal structure in Japanese:

(13) Dareka-ga dono-hito-mo hon-o katta to omotteiru.
someone-Nom everyone book-Acc bought Comp thinks
`Someone thinks that everyone bought a book.'

The interpretation of (13) is unambiguous like in English (Lasnik and Saito 1992). As shown in (14), the surface scope reading is possible, but the inverse scope reading is not:

(14) a. [ok] There is some x, such that for every y, x thinks that y bought a book.
b. * For every y, there is some x such that x thinks that y bought a book.

As in English, the example of the bi-clausal structure (13) in Japanese also shows that QR is clause-bound in finite clauses: *dono-hito-mo* (everyone) cannot be raised higher than *dareka* (someone) by QR at LF.

(15) [dareka-ga [dono-hito-mo hon-o katta to] omotteiru.]
someone-Nom everyone book-Acc bought Comp thinks
* QR out of the embedded clause

The interpretations of *some/every* interaction in mono-clausal and bi-clausal structures in English and Japanese are summarized in the table below:

Table 1: *Some/every* interaction in English and Japanese

	English		Japanese	
	∃>∀(surface)	∀>∃(inverse)	∃>∀(surface)	∀>∃(inverse)
Mono-clausal (canonical)	ok	ok	ok	*
Mono-clausal (scrambled)	—	—	ok	ok
Bi-clausal	ok	*	ok	*

The difference between English and Japanese is that inverse scope readings in canonical mono-clausal structures are not allowed in Japanese, but the inverse scope readings become available in scrambled mono-clausal structures in Japanese. In bi-clausal structures, the inverse scope readings are not allowed in both English and Japanese.

Before going into our experiment, let us review previous studies regarding quantifier scope interactions in section 3 and we will make a prediction in section 4.

3. Previous studies

3.1. Observation of Isomorphism: negation and quantifiers

Musolino (1998a, 1998b) and Musolino, Crain and Thornton (2000) examined children's interpretations of the interaction between the negation *not* and quantifiers such as *some* and *every*. Examples of those interactions are given below:

(16) a. The detective didn't find someone / some guys. (* not>some, ^{ok} some>not)
b. Every horse didn't jump over the fence. (^{ok} every>not, ^{ok} not>every)
c. The smurf didn't buy every orange. (* every>not, ^{ok} not>every)

Children's interpretations of (16) are reported as follows in Musolino, Crain and Thornton (2000). They tested 30 English-speaking children from 3;10 to 6;6 and reported that the younger group of 15 children from 3;10 to 5;2 rejected the correct inverse scope readings (*some>not*) 65% of the time. For sentences like (16b), they tested 20 children from 4;0 to 7;3 and they rejected the correct inverse scope readings (*not>every*) 92.5% of the time.[3] For sentences like (16c), Musolino (1998b) tested 20 children from 3;11 to 6;0 and they accepted the correct surface scope readings (*not>every*) 85% of the time, unlike the rejection of the *not>every* reading in (16b). Musolino (1998b) has concluded that children display adultlike knowledge when the relevant adult interpretations correspond to surface scope readings (i.e. isomorphic interpretation) as in (16c). Children typically fail to assign adultlike interpretations whenever the appropriate adult interpretations correspond to inverse scope readings (i.e. nonisomorphic interpretations) as in (16a) and (16b). Based on these results, Musolino (1998b) and Musolino, Crain and Thornton (2000) gave the descriptive generalization in (17)[4]:

(17) The Observation of Isomorphism
Unlike adults, young children systematically interpret negation and quantified NPs on the basis of their position in overt syntax.

In contrast to what Musolino (1998a, 1998b) and Musolino, Crain and Thornton (2000) reported, Isomorphism is not observed in the case of the acquisition of *some/every* interaction in mono-clausal structures in Japanese. Rather, the case of Japanese *some/every* interaction seems to be the reverse of Isomorphism since children accept inverse scope readings when adults reject them. In the next section, we will review Japanese children's interpretations of *some/every* interaction in mono-clausal structures.

3.2. Some/every interaction in mono-clausal structures: Sano (2004)

Sano (2004) examined the interpretations of *some/every* interaction in canonical mono-clausal structures and scrambled mono-clausal structures by children acquiring Japanese. The method he used was the Truth Value Judgment Task (Crain and Thornton 1998). The child was shown a series of three pictures and the experimenter told a relevant story. At the end of the story, the experimenter who played the role of a puppet described the last picture, and the child was asked to judge whether the puppet's description was right or wrong by giving the puppet a candy or a stone. In the first picture of the series, there are three cats and four children. The faces of three children are visible and the names are given in narration, while the back of the fourth child is shown in the picture and his name is unknown. In one scenario, the nameless child caught all three cats at the end (i.e. *some>every* situation). This situation can be described by either the test sentence (18), which is a

[3] Although the the results of the experiments testing (16a) and (16b) were originally reported in Musolino (1998a), those results are shown in a different way in Musolino, Crain and Thornton (2000), so we used the percentages reported in Musolino, Crain and Thornton (2000).
[4] See Gualmini (2005) for the counterargument for the acquisition of the interaction between negation and the quantifier *some*.

canonical mono-clausal structure, or the test sentence (19), which is a scrambled mono-clausal structure:

(18) Canonical mono-clausal structure
Dareka-ga dono-neko-mo tukamaeta. (^{ok}some>every, * every>some)
someone-Nom every-cat caught
'Someone caught every cat.'

(19) Scrambled mono-clausal structure
Dono-neko-mo$_i$ dareka-ga t_i tukamaeta. (^{ok}some>every, ^{ok}every>some)
every-cat someone-Nom caught
'Every cat, someone bought.'

In the other scenario, each of the three children whose names were known caught one cat at the end (i.e., *every>some* situation.) The aim of the experiment was to see whether the children accepted both (18) and (19) for *some>every* situation and rejected (18) but accepted (19) for *every>some* situation.

The results of Sano's experiment are shown in Table 2:

Table 2: The correct response rates of Sano's (2004) experiment

	A	B	C	D
Situation	some>every	some>every	every>some	every>some
Sentence	(18)	(19)	(18)	(19)
Right answer	accept	accept	reject	accept
Children (4;1-6;5)	90% (18/20)	75% (15/20)	30% (6/20)	70% (14/20)
Adult Control	100% (10/10)	100% (10/10)	80% (8/10)	100% (10/10)

Column A and B show that the children mostly accepted surface scope readings, namely the *some>every* situation, correctly for both the canonical and scrambled mono-clausal structures. On the other hand, column C shows that the children did not reject the inverse scope readings for the canonical mono-clausal structures 70% of the time, although adults were successful in rejecting the inverse scope reading 80% of the time. Column D shows that the children accepted the inverse scope readings for scrambled mono-clausal structures correctly 70% of the time.[5] Therefore, Sano's experiment showed that the Japanese children's interpretations were different from those of Japanese adults in that they accepted the inverse scope reading for (18).

4. Prediction

Japanese children's failure to reject the inverse scope readings of canonical mono-clausal structures in Sano's (2004) experiment suggests that Japanese children's interpretation of (18) may be the same as that of English-speaking adults. As we have seen in 2.1, *some/every* interaction in a mono-clausal structure in English such as 'Someone loves everyone' allows for both surface and inverse scope readings. If Japanese children's interpretation is not the same as that of their target language (i.e., Japanese) but the same as another language (i.e., English in this case), Japanese children's interpretation of *some/every* interaction can be explained by the Weak Continuity Hypothesis (Borer and Wexler 1987, Goodluck 1986, Hyams 1986, Wexler and Manzini 1987, Weissenborn, Goodluck and Roeper 1992 among others). The explanation of the Weak Continuity Hypothesis is given as follows:

[5] According to Sano (2004), 13 children among 20 accepted the inverse scope readings for both (18) and (19).

(20) Weak Continuity Hypothesis

During development, the grammar of the child permits structures that are impossible or only marginally possible in the target language but are possible structures in other languages, that is, they obey principles of Universal Grammar. Moreover, the principles are used in such a way that each non-adult grammar corresponds to a "possible human language." (Weissenborn, Goodluck and Roeper 1992)

It is possible to say that the Japanese children accepted the inverse scope reading of *some/every* interaction in Japanese mono-clausal structure because it is possible in English, although it is not allowed in the target language, namely Japanese. In other words, the inverse scope reading of *some/every* interaction in a mono-clausal structure is allowed by possible grammar constrained by the principles of Universal Grammar.

If the Weak Continuity Hypothesis is on the right track to explain Japanese children's interpretation of *some/every* interaction in mono-clausal structures, what can we predict for children's interpretation of *some/every* interaction in finite bi-clausal structures? As we have seen in section 2, when *some* and *every* are in a different finite clause in a bi-clausal structure such as 'Someone thinks that everyone bought a book', the sentence is unambiguous both in English and Japanese: only the surface scope reading (*some>every*) is possible. Based on this fact, we predict as follows:

(21) Prediction

If the Weak Continuity Hypothesis is correct in explaining Japanese children's interpretation of *some/every* interaction, Japanese children should be able to reject the inverse scope readings for *some/every* interaction in finite bi-clausal structures, since the inverse scope reading is not possible for finite bi-clausal *some/every* interaction in English.

If Japanese children cannot reject the inverse scope readings for finite bi-clausal *some/every* interaction, it shows that Japanese children's interpretations are different compared to those of English-speaking adults, hence we may not be able to prove that the Weak Continuity Hypothesis is on the right track to explain the acquisition of *some/every* interaction in Japanese. To test our prediction, we conducted an experiment, which is in the next section.

5. Experiment

The aim of this experiment is to test children's interpretations of *some/every* interaction in canonical mono-clausal structures and finite bi-clausal structures. The subjects were 28 monolingual Japanese-speaking children (4;3 – 6;9) and 11 native Japanese adults as controls. The number of the subjects in each age group is shown as follows:

Table 3: The number of subjects in each age group

Age	4 years old	5 years old	6 years old	Adults
Number	7	9	12	11

The method we used was the Truth Value Judgment Task. The experiment was divided into two parts: bi-clausal structures were tested on the first day and mono-clausal structures were tested on the second day. In the experiment, an experimenter narrated a story by moving characters and objects which were made of papers and stuck with double-sided tape on a board. At the end of the story, the child could see what happened to the characters and the objects on the board. After the story, the other experimenter, who played the role of a puppet, gave the description of what happened, i.e., a test sentence including *some* and *every*, to the child. The child was asked to judge whether the description of the puppet was right or wrong, by giving a cookie or a plastic green pepper to the puppet. The two types of the test sentences and examples are as follows:

(22) *some/every* in a canonical mono-clausal structure

Dareka-ga	dono-neko-mo	tukamaetayo.
Someone-Nom	every-cat	caught

'Someone caught every cat.'

(23) *some/every* in a bi-clausal structure

Dareka-ga	dono-ringo-mo	oisii-to	ittayo.
Someone-Nom	every-apple	delicious-that	said

'Someone said that every apple was delicious.'

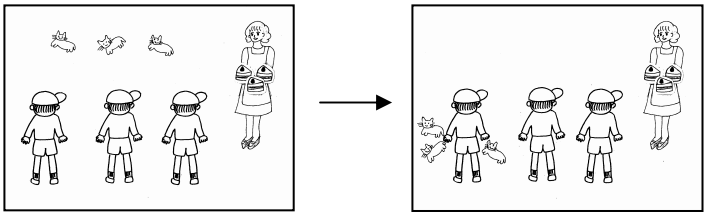
Regarding canonical mono-clausal structures, we used 4 sentences like (22), 2 sentences with the scenarios in which the surface scope reading was possible and 2 sentences with the scenarios in which the inverse scope reading was possible. As for bi-clausal structures, we used 4 sentences like (23), 2 sentences with the scenarios in which the surface scope reading was possible and 2 sentences with the scenarios in which the inverse scope reading was possible. We also tested the children's knowledge of *some*, *every* and bi-clausal structures without quantifiers with matched and mismatched conditions. Five children were not included in Table 3 because they did not interpret *every* and/or *some* correctly. The 28 children in Table 3 responded correctly for 2 bi-clausal sentences without quantifiers in the practice session.

A sample scenario for a mono-clausal structure is shown in (24):

(24) The mother was trying to catch the cats which ran away. She said that she could give one piece of cake as a reward for each cat that the boys caught. There were three cats. The three boys were turned around so that their names were unknown. They tried to catch the cats. (One of the boys:) "I want lots of cakes. I will try to catch many cats." The boys ran after the cats. Then this is what happened. (Only one boy caught the three cats.) The other two boys regretted, "(I) couldn't catch them."

Puppet:	Dareka-ga	dono-neko-mo	tukamaetayo. (True; some>every)
	someone-Nom	every-cat	caught

'Someone caught every cat.'



For the canonical mono-clausal structure, one boy caught all the three cats in the matched scenario above (*some>every* situation). In the mismatched scenario, all the three boys caught one cat each (*every>some* situation). The test sentences were basically the same as the ones tested in Sano's (2004) experiment.[6]

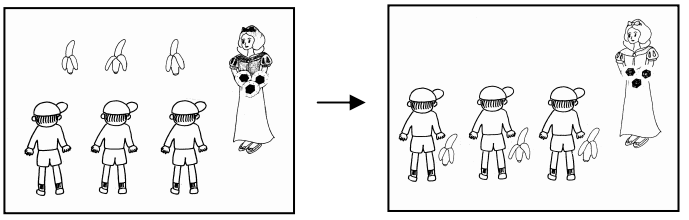
A sample scenario for a bi-clausal structure is shown in (25):

(25) Snow White was looking for delicious bananas. She said that she was going to give someone a jewel if that person brought her a delicious banana. There were three bananas. The three boys were turned around

[6] The difference between this experiment and the experiment in Sano (2004) is that we used the pictures of the three boys whose backs are turned and names are unknown. In Sano's experiment, among the four boys in the picture, only one boy's name was unknown and his back was turned, while the other three boys' names were given and faced the front. It is not clear whether this difference made any changes in the results, but our result shows better performance for canonical mono-clausal structures. Children rejected the inverse scope readings in mono-clausal structures more in our experiment (67.9%).

and their names were unknown. They tasted the bananas. (One of the boys:) "I want many jewels. I'm going to look for many delicious bananas." (The boy bit into three bananas.) "This one is sweet and tastes good. This one is a little hard. This one is very soft. I like the sweet one. This banana is good." (Another boy bit into the three bananas.) "I like the hard one. This banana is good." (The last boy bit into the three bananas.) "I like the soft one. This banana is good." The three boys decided to bring the bananas they chose to Snow White.

Puppet: Dareka-ga dono-banana-mo oishii-to ittayo. (False; *every>some)
someone-Nom every-banana delicious-Comp said
'Someone said that every banana was delicious.'



In the mismatched scenario above, each boy said that a different banana was delicious. In the matched scenario, only one boy said that all the three bananas were delicious.

6. Results

The results of the experiment are shown in the tables below. First, let us look at the results of the mono-clausal structures in Table 4:

Table 4: Correct response rates for mono-clausal structures

	Children	Adults
Accepting surface scope readings (some>every)	92.9% (52/56)	100.0% (22/22)
Rejecting inverse scope readings (every>some)	67.9% (38/56)	100.0% (22/22)

As we can see in Table 4, there was 92.9% acceptance of the surface scope readings, almost like adults. On the other hand, the children rejected the incorrect inverse scope readings 67.9% of the time, whereas the adults rejected the inverse scope readings 100% of the time. Although the children's rejection rate of the inverse scope reading in this experiment is higher than Sano's (2004) results, there is still not a substantial rejection rate of inverse scope readings. In other words, the children mostly accepted the surface scope readings and they occasionally accepted the inverse scope readings.

Table 5 is the results of the bi-clausal structures:

Table 5: Correct response rates for bi-clausal structures

	Children	Adults
Accepting surface scope readings (some>every)	94.6% (53/56)	95.5% (21/22)
Rejecting inverse scope readings (every>some)	51.8% (29/56)	95.5% (21/22)

Table 5 shows that the children accepted surface scope readings correctly 94.6% of the time, which is close to the rate of the acceptance for mono-clausal structures. However, the children rejected inverse scope readings

only 51.8% of the time for the bi-clausal structures. This rate is even lower than the rejection rate for the mono-clausal structures. Regarding the adults as controls, they were quite successful (95.5%) in rejecting the inverse scope reading for bi-clausal structures.

Let us now consider the individual results, comparing the results of mono-clausal and bi-clausal structures individually in Table 6:

Table 6: Number of subjects rejecting at least 1 inverse scope reading (ISR) in mono-clausal and bi-clausal structures

	Children	Adults
(A) not rejecting ISR in mono-clausal structures	11	0
(B) not rejecting ISR in bi-clausal structures among (A)	10	0

There were 11 subjects who could not reject at least one inverse scope reading for mono-clausal structures. Among them, 10 of the subjects also could not reject at least one inverse scope reading for bi-clausal structures. These results show that, except for 1 child, the Japanese children did not interpret *some/every* interaction like English-speaking adults.

7. Discussion

The issues we have considered are Isomorphism, the Rigidity Condition, the clause-bound property of Quantifier Raising, and the Weak Continuity Hypothesis.

Firstly, our results show that the Japanese children could not reject the inverse scope readings for both mono-clausal and bi-clausal structures. These results contrast with the observation of Isomorphism, repeated below:

(26) The observation of Isomorphism (Musolino (1998b), Musolino, Crain and Thornton (2000))
Unlike adults, young children systematically interpret negation and quantified NPs on the basis of their position in overt syntax.

Our results show that Isomorphism is not consistently observed in the acquisition of *some/every* interaction in Japanese.[7]

Secondly, the fact that Japanese children could not reject the inverse scope reading of canonical mono-clausal structures possibly shows that Japanese children are not sensitive to the Rigidity Condition. In section 2, we have seen that the LF representation like (27), which induces the inverse scope reading, is not allowed due to the violation of the Rigidity Condition (Lasnik and Saito 1992):

(27) * [$_{IP}$ daremo$_2$ [$_{IP}$ dareka$_1$ [$_{IP}$ t_1 t_2 aisiteiru]]]
everyone someone loves
'Someone loves everyone.'

To have the inverse scope reading (i.e., every>some) , *daremo* (everyone) needs to move higher than *dareka* (someone) by Quantifier Raising (QR) as shown in (27), but (27) violates the Rigidity Condition since t_1 asymmetrically c-commands t_2 and thus *daremo* (everyone) cannot take wide scope over *dareka* (someone). Since Japanese children accepted inverse scope readings induced by the LF representations like (27) which violate the Rigidity Condition, it suggests that Japanese children are not sensitive to the Rigidity Condition.

Thirdly, the fact that Japanese children could not reject the inverse scope readings of bi-clausal structures

[7] Musolino, Crain and Thornton (2000) note that it is not clear whether the quantifier-quantifier interaction vs. quantifier-negation interaction should be treated uniformly or not.

indicates that they have not acquired the clause-bound property of Quantifier Raising. Remember that the inverse scope reading of a bi-clausal structure is not allowed in adult Japanese because of the clause-bound property of QR:

(28) * [$_{IP1}$ dono-hito-mo$_2$ [$_{IP1}$ dareka$_1$ [$_{IP1}$ t_1 [$_{CP}$ [$_{IP2}$ t_2 hon-o katta] to] omotteiru]]]
everyone someone book-Acc bought Comp thinks
'Someone thinks that everyone bought (a) book.`

Dono-hito-mo (everyone) cannot be raised higher than *dareka* (someone) by QR as in (28) since *dono-hito-mo* (everyone) cannot move from the embedded clause to the main clause due to the clause-bound property of QR in adult Japanese, but it seems that Japanese children are not sensitive to this clause-bound property of QR. In addition, (28) violates the Rigidity Condition, since t_1 c-commands t_2 and thus *dono-hito-mo*$_2$ (everyone) cannot take wide scope over *dareka*$_1$ (someone). This also suggests that Japanese children are not sensitive to the Rigidity Condition either.

Fourthly and most importantly, the Weak Continuity Hypothesis could not be confirmed for the case of the acquisition of *some/every* interaction. As we have seen in section 4, if Japanese children's interpretations were the same as those of English-speaking adults in that they could reject the inverse scope reading of bi-clausal structures, the Weak Continuity Hypothesis could explain the acceptance of the inverse scope readings of canonical mono-clausal structures by Japanese children. Namely, it is possible that Japanese children are giving interpretations different from their target language but their interpretations are within the range of possible grammar constrained by Universal Grammar. However, according to the results of the experiments, Japanese children accepted inverse scope readings for canonical mono-clausal structures, like English-speaking adults, but they could not reject inverse scope readings for bi-clausal structures, unlike English-speaking adults. Therefore, it turns out that Japanese children did not take the English option, and we are forced to conclude that the Weak Continuity Hypothesis cannot explain the acquisition of *some/every* interaction in mono-clausal and bi-clausal structures in Japanese.

8. Conclusion

This paper examined Japanese children's interpretations of *some/every* interaction in mono-clausal and bi-clausal structures to investigate whether the Weak Continuity Hypothesis can explain the acquisition of *some/every* interaction in Japanese. The results of the experiments show that Japanese children accepted inverse scope readings for canonical mono-clausal structures, but they could not reject inverse scope readings for bi-clausal structures. These results suggest that Japanese children are not taking the English option when they acquire *some/every* interaction in Japanese. Therefore, the Weak Continuity Hypothesis cannot explain the acquisition of *some/every* interaction. Japanese children's acceptance of inverse scope readings for canonical mono-clausal structure is due to other factors rather than Weak Continuity. We leave this issue for future research.

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References

Aoun, Joseph and Yen-hui Audrey Li (1993) *Syntax of Scope.* Cambridge, Mass.: MIT Press.

Borer, Hagit and Kenneth Wexler (1987) 'The Maturation of Syntax.' In Thomas Roeper and Edwin Williams (eds.), *Parameter Setting.* Dordrecht: Reidel.

Crain, Stephen and Rosalind Thornton (1998) *Investigations in Universal Grammar: A Guide to Experiments on the Acquisition of Syntax and Semantics.* Cambridge, Mass.: MIT Press.

Goodluck, Helen (1986) 'Language Acquisition and Linguistic Theory.' In Paul Fletcher and Michael Garman (eds.), *Language Acquisition* (2nd ed.). Cambridge: Cambridge University Press.

Gualmini, Andrea (2005) *Ups and Downs of Child Language: Experimental Studies on Children's Knowledge of Entailment Relationships and Polarity Phenomena.* London: Routledge.

Hornstein, Norbert (1995) *Logical Form: From GB to Minimalism.* Cambridge, Mass.: Blackwell Publishers.

Hyams, Nina (1986) *Language Acquisition and the Theory of Parameters*. Dordrecht: Reidel.

Johnson, Kyle (2000) 'How Far Will the Quantifiers Go?' In Roger Martin, David Michaels, and Juan Uriagereka (eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, Cambridge, Mass.: MIT Press.

Kuroda, Shige-Yuki. (1970) 'Remarks on the Nortion of Subject with Reference to Words like *Also, Even* or *Only*. Part II.' *Annual Bulletin vol.*4, 127-152, Logopedics and Phoniatrics Research Institute, University of Tokyo.

Lasnik, Howard and Mamoru Saito (1992) *Move α.* Cambridge, Mass.: MIT Press.

Mahajan, Anoop (1990) *The A/A-bar Distinction and Movement Theory.* Doctoral Dissertation, MIT.

May, Robert (1977) *The Grammar of Quantification*. Doctoral Dissertation, MIT.

May, Robert (1985) *Logical Form: Its Structure and Derivation*. Cambridge, Mass.: MIT Press.

Murasugi, Keiko and Mamoru Saito (1992) 'Quasi-Adjuncts as Sentential Arguments.' In *The Proceedings of Western Conference on Linguistics* 22: 251-264.

Musolino, Julien (1998a) 'Not Any Child Can Deal with *Some*.' *BUCLD*22. Somerville, Mass.: Cascadilla Press.

Musolino, Julien (1998b) *Universal Grammar and the Acquisition of Semantic Knowledge: An Experimental Investigation into the Acquisition of Quantifier-Negation Interaction in English*. Doctoral Dissertation, University of Maryland at College Park.

Musolino, Julien, Stephen Crain and Rosalind Thornton (2000) 'Navigating Negative Quantificational Space.' *Linguistics* 38-1: 1-32.

Saito, Mamoru (1992) 'Long Distance Scrambling in Japanese.' *Journal of East Asian Linguistics* 1: 69-118.

Sano, Tetsuya (2004) 'Scope Relations of QP's and Scrambling in the Acquisition of Japanese.' In *The Proceedings of GALA2003 (Generative Approaches to Language Acquisition.)*

Tada, Hiroaki (1993) *A/A-bar Partition in Derivation*. Doctoral Dissertation, MIT.

Weissenborn, Jürgen, Helen Goodluck, and Thomas Roeper (1992) 'Introduction: Old and New Problems in the Study of Language Acquisition.' In Jürgen Weissenborn, Helen Goodluck and Thomas Roeper (eds.), *Theoretical Issues in Language Acquisition*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.

Wexler, Kenneth, and Maria Rita Manzini (1987) 'Parameter and Learnability in Binding Theory.' In Thomas Roeper and Edwin Williams (eds.), *Parameter Setting.* Dordrecht: Reidel.

Williams, Edwin (1986) 'A Reassignment of the Functions of LF.' *Linguistic Inquiry* 17: 265-299.

Yoshimura, Noriko (1992) *Scrambling and Anaphora in Japanese.* Doctoral Dissertation, University of Southern California.

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