Wh-islands in Child Japanese Revisited

Koji Sugisaki and Keiko Murasugi
Mie University and Nanzan University

1. Introduction

Linguistic theory within the generative framework attempts to answer "the logical problem of language acquisition" (Baker & McCarthy 1981, Hornstein & Lightfoot 1981), which refers to the problem of why children are able to acquire the knowledge of their native languages under the "poverty of the stimulus" situation. The proposed solution postulates that a human child is innately equipped with Universal Grammar (UG), which narrowly constrains the space of hypotheses about the target language. In contrast, the theory of language acquisition aims to answer "the developmental problem of language acquisition," which refers to a broader question of how language is acquired in the actual time course.

One of the principal issues in constructing the theory of language acquisition has been to specify when and how the innate principles of UG start constraining the course of acquisition. A number of experimental studies indicated that children conform to these principles as soon as they become able to use relevant lexical items and structures (e.g. Otsu 1981, Crain 1991). Prominent among these are the studies which demonstrated children's early mastery of the UG principles regulating overt *wh*-movement. For example, Otsu (1981) argued that English-speaking children are sensitive to the Complex NP Constraint (Ross 1967), by showing that these children exclude overt *wh*-movement from within a relative clause as in (1).

(1) * What$_1$ is Jane drawing a monkey [that is drinking milk with t_1] ?

In contrast to the acquisition of overt *wh*-movement and its restrictions, few studies have looked at children's knowledge of the in-situ *wh*-phrases and its UG

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constraints, despite the fact that theoretical investigations into these properties have been playing a significant role in formulating the overall architecture of UG.[1] In light of this background, this study builds on a previous study by Otsu (2007) and addresses the question of whether Japanese-speaking preschool children exhibit the same sensitivity to the *Wh*-island Condition (Chomsky 1964) as adults. The results of our experiment, even though preliminary, provides a new piece of evidence from the acquisition of *wh*-in-situ for the early emergence of innate principles.

2. *Wh*-island Condition in English and Japanese

It has been observed at least since Chomsky (1964) that in English, overt *wh*-extraction out of an embedded interrogative clause is not permitted, as illustrated by the contrast in (2). The constraint that lies behind the degraded status of (2a) is called the *Wh*-island Condition.

(2) a. * What$_1$ does John know [<u>whether</u> Mary bought t_1] ?
b. What$_1$ does John know [<u>that</u> Mary bought t_1] ?

Watanabe (1992) argues that the corresponding *wh*-island effects can also be detected in Japanese, which is a *wh*-in-situ language.[2] Thus, a *wh*-phrase in an interrogative complement clause as in (3a) is prevented from taking scope in the matrix clause, and hence the sentence is degraded as a *wh*-question. In contrast, a *wh*-phrase in a declarative complement clause as in (3b) can (and must) take scope in the matrix clause, and the sentence is interpreted as a *wh*-question.

(3) a. * John-wa [Mary-ga nani-o katta <u>ka dooka</u>]
John-TOP *Mary-NOM* *what-ACC* *bought* *whether*
iimasita ka ?
said *Q*
'What did John say whether Mary bought?'

b. John-wa [Mary-ga nani-o katta <u>to</u>]
John-TOP *Mary-NOM* *what-ACC* *bought* *that*
iimasita ka?
said *Q*
'What did John say that Mary bought?'

1. See Richards (2008) and Watanabe (2003) for an overview of the *wh*-island effects in Japanese.
2. See also Nishigauchi (1990) and Lasnik & Saito (1992).

In an example like (4), the *Wh*-island Condition has an effect not on its grammatical status but on its available interpretation: The *wh*-phrase is necessarily associated with the embedded question marker (the underlined *ka*) and has to take scope in the embedded clause, which forces the sentence to be interpreted not as a *wh*-question but as a *yes*/*no* question.

(4) John-wa [Mary-ga nani-o katta ka]
John-TOP *Mary-NOM* *what-ACC* *bought* *Q*
iimasita ka ?
said *Q*
?* 'What did John say whether Mary bought?' /
OK 'Did John say what Mary bought?'

Even though the exact nature of the *Wh*-island Condition (as well as the nature of the violation in the Japanese examples) is still under detailed investigation, the existing parallel paradigm of *wh*-questions in English and Japanese suggests that this constraint reflects some innate principles of UG.[3] Then, we can expect that children conform to this condition from the earliest observable stages. In the next section, we briefly review two studies that evaluated the validity of this prediction.

3. *Wh*-island Condition in Child Languages: Previous Studies

3.1. Wh-island Condition in Child English

In order to evaluate the early emergence of the *Wh*-island Condition in child English, de Villiers, Roeper & Vainikka (1990) conducted an experiment with 25 English-speaking children, ranging in age from 3;07 to 6;11. The task for children was Question-after-Story: Each child was told a story accompanied by a series of pictures, and at the end of the story, the experimenter asked a question about that story. The experiment consisted of the following six types of questions, each of which had two trials (except for (5c) and (6b), which had four trials).

(5) Argument *wh*-questions
a. No medial *wh*:
Who did the girl ask *t* [to help *t*] ?
b. Argument-*wh* medial:
Who did the girl ask *t* [what to throw **t*] ?

3. See Richards (2008) for a summary of various approaches to the *Wh*-island Condition.

c. Adjunct-*wh* medial:
Who did Big Bird ask *t* [<u>how</u> to paint **t*] ?

(6) Adjunct *wh*-questions

a. No medial *wh*:
When did the boy say *t* [he hurt himself *t*] ?

b. Argument-*wh* medial:
How did Kermit ask *t* [<u>who</u> to help **t*] ?

c. Adjunct-*wh* medial:
When did the boy know *t* [<u>how</u> he hurt himself **t*] ?

These questions were potentially ambiguous, in that the sentence-initial *wh*-phrase could originate either in the matrix clause or in the embedded clause (as indicated by the two trace positions in these sentences). Yet, in adult grammar, the interpretation in which the *wh*-phrase has been extracted from the complement clause is ruled out for (5b,c) and (6b,c), since that interpretation should stem from moving the *wh*-phrase out of an interrogative clause and hence should induce a violation of the *Wh*-island Condition. Thus, if children have adult-like knowledge of this constraint, they should associate the sentence-initial *wh*-phrase only with the matrix clause, in the case of (5b,c) and (6b,c).

The results of their experiment are summarized in Table 1.[4]

Question Types	Argument *wh*-questions (5)		Adjunct *wh*-questions (6)	
	matrix interpretation	*embedded interpretation*	*matrix interpretation*	*embedded interpretation*
No medial *wh*	68% (34)	32% (16)	50% (25)	44% (22)
Argument-*wh* medial	70% (35)	2% (1)	23% (23)	8% (8)
Adjunct-*wh* medial	63% (63)	30% (30)	48% (24)	6% (3)

Table 1: Summary of the Results of
de Villiers, Roeper & Vainikka's (1990) Experiment

Children preferred to assign 'short-distance' interpretation of the sentence-initial *wh*-phrase (which corresponds to the matrix interpretation of the

4. Errors were observed with sufficient frequency in which children answered the medial *wh*-phrases (the underlined *wh*-phrases in (5) and (6)). See de Villiers, Roeper & Vainikka (1990) for the discussion as to why this type of errors could have happened.

wh-phrase) even when there was no intervening *wh*-phrase as in (5a) and (6a). Still, a sharp contrast was found in the case of (5b) and (6c): In the case of argument *wh*-questions such as (5b), in which the complement clause is introduced by an argument *wh*-phrase, 70% of children's answers were 'short-distance' answers, while only 2% of their answers were 'long-distance' answers (which should stem from the embedded interpretation of the sentence-initial *wh*-phrase). Similarly, in the case of adjunct *wh*-questions such as (6c), in which the complement clause is introduced by an adjunct *wh*-phrase, children provided 'short-distance' answers 48% of the time, while they provided 'long-distance' answers only 6% of the time. Given that the 'long-distance' answers to these questions should involve a violation of the *Wh*-island Condition, the scarcity of the 'long-distance' answers is consistent with the view that English-speaking preschool children have knowledge of the *Wh*-island Condition.[5]

3.2. Wh-island Condition in Child Japanese

The promising findings from child English naturally led to the question of whether Japanese-speaking preschool children also exhibit the *wh*-island effects. In order to answer this question, Otsu (2007) conducted an experiment with 40 children (20 three-year-olds and 20 four-year-olds). This experiment employed a Truth-Value Judgment Task (Crain & Thornton 1998). In this task, children listened to a story with a puppet named John (manipulated by another experimenter). After the story, the experimenter asked a series of questions to the puppet, and the puppet answered each of these questions. The task for children was to evaluate whether the responses from the puppet were appropriate or not. A sample story and the questions that followed this story were given in (7) and (8).

(7) *Sample Story:*
Taro and Hanako were watching TV together in the living room. Their mother came home, and brought them some snacks. And she asked Taro, "Taro, who's your favorite?" Taro replied, "Of course, I like Doraemon." Mother asked Hanako, "And you?" Hanako likes Nobita, but felt a bit shy and replied "That's a secret."

5. An important question remains as to why the contrast was less sharp in the case of (5c) and (6b). See de Villiers, Roeper & Vainikka (1990) for the relevant discussion.

(8) *Questions to John and John's Replies:*[6]

a. Okaasan-wa Hanako-ni [dare-ga suki ka]
mother-TOP *Hanako-DAT* *who-NOM* *like* *Q*
kikimasita ka ?
asked *Q*
'Did Mother ask Hanako who she likes?'
John's Reply: Hai. 'Yes'

b. Okaasan-wa Taro-ni-mo [dare-ga suki ka]
mother-TOP *Taro-DAT-also* *who-NOM* *like* *Q*
kikimasita ka ?
asked *Q*
'Did Mother also ask Taro who he likes?'
John's Reply: Hai. 'Yes'

c. Hanako-wa [dare-ga suki <u>ka</u>] iimasita ka ?
Hanako-TOP *who-NOM* *like* *Q* *said* *Q*
?* 'Who did Hanako say whether she likes?' /
OK 'Did Hanako say who she likes?'
John's Reply: Hai. 'Yes'

d. Taro-wa [dare-ga suki <u>to</u>] iimasita ka ?
Taro-TOP *who-NOM* *like* *that* *said* *Q*
'Who did Taro say he likes?'
John's Reply: Hai. 'Yes'

When presented with the questions illustrated in (8), the puppet always responded 'Yes'. This answer is appropriate for the questions in (8a-b), but not for the questions in (8c-d). In the case of (8c), a *wh*-phrase is contained within an embedded interrogative clause introduced by the question marker *ka*. Thus, in this sentence, the *wh*-phrase only takes scope in the embedded clause, and the entire sentence receives an interpretation as a *yes*/*no* question. Then, the puppet's *yes* answer is simply false, because Hanako did not tell her mother who she likes. In the case of (8d), a *wh*-phrase appears within a declarative complement clause and hence takes scope in the matrix clause. Thus, the sentence can only be interpreted as a *wh*-question, which makes the puppet's *yes* response an inappropriate answer to (8d). If children were not able to distinguish between the interrogative complementizer *ka* and the declarative complementizer *to*, they should misinterpret the question in (8d) as a *yes*/*no* question. Then, those children should judge the puppet's *yes* answer as appropriate, since in the story Taro actually told his mother who he likes (i.e. *Doraemon*).

6. *dare-ga* 'who-NOM' in these sentences is a nominative object.

Otsu (2007) reasoned that, if Japanese-speaking preschool children have knowledge of the *Wh*-island Condition, they should be able to judge the puppet's *yes* response as inappropriate both for questions like (8c) and for questions like (8d), despite the fact that these sentences contain embedded clauses introduced by different types of complementizers (interrogative *ka* in (8c) and declarative *to* in (8d)).

The main results of Otsu's (2007) experiment are summarized in Table 2.

	Children's Judgments on the Puppet's YES Response	
	Judged as Appropriate	*Judged as Inappropriate*
[wh … Q] … Q ? as in (8c)	0% (0/80)	100% (0/80)
[wh … that] … Q ? as in (8d)	8% (6/80)	92% (74/80)

Table 2: Summary of the Results of Otsu's (2007) Experiment

As we can see in Table 2, children rejected the puppet's *yes* response to questions such as (8c) 100% of the time, and also they rejected the *yes* response to questions such as (8d) more than 90% of the time. Otsu interpreted these results as indicating that Japanese-speaking preschool children have the knowledge that (8c) should be interpreted as a *yes*/*no* question, as well as the knowledge that (8d) can only be interpreted as a *wh*-question. Since the interpretation for (8c) a *yes*/*no* question has its basis on the *wh*-island effects, Otsu (2007) concluded that children as young as three years old can be shown to obey the *Wh*-island Condition in Japanese.

4. *Wh*-island Condition in Child Japanese: A New Experiment

4.1. Limitation of Otsu's (2007) Experiment

The experiment by Otsu (2007), if successful, would have large theoretical significance, in that it was the very first attempt to show that the *wh*-island effects can be observed even in the acquisition of a *wh*-in-situ language. However, the experiment has an obvious limitation in its design, and fails to demonstrate Japanese-speaking children's knowledge of the *Wh*-island Condition. Let us recall the *wh*-island effects in Japanese, illustrated in (3a) and (4) (and repeated here in (9)).

(9) a. * John-wa [Mary-ga nani-o katta <u>ka dooka</u>]
John-TOP *Mary-NOM* *what-ACC* *bought* *whether*
iimasita ka ?
said *Q*
'What did John say whether Mary bought?'

b. John-wa [Mary-ga nani-o katta ka]
John-TOP *Mary-NOM* *what-ACC* *bought* *Q*
iimasita ka ?
said *Q*
?* 'What did John say whether Mary bought?' /
OK 'Did John say what Mary bought?'

As these examples suggest, the *Wh*-island Condition does not permit a *wh*-phrase contained within an interrogative complement clause to take scope in the matrix clause. In other words, what this condition dictates is that these sentences are degraded as a *wh*-question: In (9a), the sentence becomes ill-formed since it only has an interpretation as a *wh*-question, while in (9b), the sentence itself is still grammatical because the sentence has an alternative interpretation as a *yes*/*no* question.

In light of this discussion, let us now go back to the crucial test sentence used in Otsu's (2007) experiment.

(10) (=(8c)) Hanako-wa [dare-ga suki ka] iimasita ka ?
Hanako-TOP *who-NOM* *like* *Q* *said* *Q*
?* 'Who did Hanako say whether she likes?' /
OK 'Did Hanako say who she likes?'
John's Reply: Hai. 'Yes'

Much like the case of (9b), the *Wh*-island Condition rules out from this sentence an interpretation as a *wh*-question. Then, if we are to determine that Japanese-speaking children have knowledge of the *wh*-island effects, we have to demonstrate that children disallow the sentence in (10) as a *wh*-question. In order to achieve this, the design of the experiment has to undergo a small but quite significant modification in which the puppet incorrectly interprets the question in (10) as a *wh*-question and provides an answer like *Nobita*. If *wh*-island effects are indeed in the grammar of Japanese-speaking children, they should judge this type of response as inappropriate.

In order to provide a more convincing piece of evidence for the early emergence of *wh*-island effects, we incorporated this modification and conducted a new experiment, which is discussed below.

4.2. Subjects and Method

The subjects of our experiment were 28 Japanese-speaking preschool children,

ranging in age from 3;09 to 5;05 (mean age 4;07). The task for the children was a combination of (i) Question-after-Story and (ii) an Appropriateness Judgment Task. In this task, each child was told a story, which was accompanied by a series of pictures presented on a laptop computer. At the end of each story, an experimenter asked the child two questions about the story. After the child responded to these questions, the same questions were posed to a puppet, and the child was asked to judge whether each of the puppet's response to the questions was appropriate or not.

A sample story and the sample test sentences that follow this story are given in (11) and (12), respectively.

(11) *Sample Story:*

Today, Monkey is visiting Elephant's house. On the table, they had a choice of pancakes and fruits, and they decided to have some fruits. Elephant asked Monkey, "What is your most favorite fruit?", and Monkey replied, "Strawberries!" Then, Elephant's father came back home from work, and asked Elephant, "What is your most favorite fruit?" Elephant felt a bit shy, and hesitated to answer it. However, Elephant got a toy train from Father, so he replied, "Grapes!"





(12) Sample Test Sentences:

a. Osarusan-wa [nani-ga ichiban suki to]
monkey-TOP *what-NOM* *best* *like* *that*
Zousan-ni itta kana ?
elephant-to *said* *Q*
'What did Monkey say to Elephant [that he likes *t* best] ?
Puppet's Answer: Ichigo ! *(Strawberries!)*

b. Zousan-wa [nani-ga ichiban suki ka]
elephant-TOP *what-NOM* *best* *like* *Q*
Otoosan-ni itta kana ?
father-to *said* *Q*
'Did Elephant say to his father [what he likes *t* best] ?'
Puppet's Answer: * Budou ! *(Grapes!)*

The test sentence in (12a) contains a declarative complement clause and hence the sentence should be interpreted as a *wh*-question. In contrast, the test sentence in (12b) involves an interrogative complement clause, which should induce *wh*-island effects and hence should disallow the sentence to have an interpretation as a *wh*-question.[7] Notice that in our experiment, the puppet interpreted both of the questions in (12) as a *wh*-question and provided an answer like "Ichigo!" (*Strawberries!*) or "Budou!" (*Grapes!*) to these *wh*-questions, thereby confirming that we are indeed testing *wh*-island effects in children's grammar.

The experiment consisted of two target stories and two filler stories. The order of presentation of these stories was pseudo-randomized.

4.3. Results and Discussion

The number and percentages of correct responses for each type of questions are summarized in Table 3.

When presented with a question such as in (12a), children interpreted the question as a *wh*-question, and provided an answer like *Strawberries* more than 96% of the time. These children also judged the puppet's response of *Strawberries* as appropriate more than 96% of the time. In sharp contrast, when presented with a question such as in (12b), children interpreted the question as a *yes/no* question, and provided the *yes* response more than 83% of the time. In addition, these children

7. William Snyder (personal communication) points out that the answer to the matrix-scope (and hence island-violating) question interpretation of (12b) may not be felicitous in the context of the current story. Let us consider the full-fledged answer to (12b), which should be as in (i):

(i) Zousan-wa [budou-ga ichiban suki ka]
elephant-TOP *grape-NOM* *best* *like* *Q*
Otoosan-ni itta.
father-to *said*
'Elephant told his father [whether he liked the grapes best].'

As Snyder correctly observes, this answer presupposes that the father asked a question about whether the elephant likes the grapes the best, which actually did not happen in the story. Thus, in order for the above answer to be felicitous, the story has to be modified in a way that the father asked the elephant, "What is your favorite fruit? Do you like grapes the best?".

A revised experiment that incorporates this modification is now in preparation. We thank William Snyder for valuable suggestions.

judged the puppet's response of *Grapes* as inappropriate more than 82% of the time. These results suggest that Japanese-speaking children have the knowledge that sentences such as in (12b), in which a *wh*-phrase appears within an embedded interrogative clause, does not have an interpretation as a *wh*-question. These findings argue for the view that the UG principle which is responsible for the *wh*-island effects is indeed in the grammar of Japanese-speaking preschool children.

	[wh … that] … Q ? as in (12a)		*[wh … Q] … Q ?* as in (12b)	
	Children's Answer	Children's Judgment	Children's Answer	Children's Judgment
#correct	54/56	54/56	47/56	46/56
%correct	96.4	96.4	83.9	82.1

Table 3: Summary of the Experimental Results

5. Conclusion

In this study, we addressed the question of whether Japanese-speaking preschool children already have knowledge of the UG principle responsible for the *wh*-island effects. Considering Otsu's (2007) limitation with the design of his experiment, we conducted a new experiment which circumvented this problem. Results obtained, though preliminary, are consistent with the view that the relevant principle is indeed in the grammar of Japanese-speaking children. Since Japanese is a *wh*-in-situ language and the *wh*-island effects are typically reflected only on the available interpretation for a question with an embedded interrogative clause, it would be reasonable to suspect that the input for children would contain little relevant information to "learn" the relevant condition. Thus, the findings reported in this study lend further support from the acquisition of *wh*-in-situ in Japanese for the view that the principle behind the *wh*-island effects constitutes part of the innate language faculty.

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