

## The Acquisition of Inversion in Non-Subject *Wh*-Questions by Japanese Learners of English: An Asymmetry between *Why* and Argument *Wh*-Questions\*

Miyuki Noji

*Joetsu University of Education*

### 1. Introduction

In the L1 acquisition of *wh*-questions, many English-speaking children go through a stage in which correctly-inverted questions co-exist with questions that lack inversion. This phenomenon has been investigated from various points of view: the differences among *wh*-phrases, differences among auxiliaries to be inverted, and the presence or absence of *not* (see Ambridge and Rowland (2006) for the detailed summary of previous studies). One important finding concerning the difference among *wh*-phrases in the rate of subject-auxiliary inversion is that *why* questions display the highest rate of non-inversion (Labov and Labov (1978), De Villiers (1991), Berk (2003)),<sup>1</sup> while there seems to be an asymmetry between argument and adjunct *wh*-questions (Erreich (1984), Stromswold (1990)).

Two different approaches have been proposed to explain the facts. Stromswold (1990) and De Villiers (1991) propose a syntactic account. De Villiers (1991) claims that *why* (as with some other adjunct *wh*-phrases) initially stays in the “IP-adjoined” position and does not move to [Spec, CP] in child grammar, and tries to link this non-adult behavior with an option sanctioned in adult languages (as in French) on the basis of Rizzi’s (1990) analysis (see also Thornton (2008)). Another account is based on input frequency (Rowland and Pine (2000, 2003)). It does not assume grammatical knowledge such as subject-auxiliary inversion, and takes the position that the acquisition of *wh*-questions is affected by input frequency of lexically specific *wh*-word + auxiliary combinations. That is, the asymmetry is regarded as just reflecting the difference of input frequency.

L2 English learners also have reportedly failed to exhibit the subject-auxiliary inversion at a certain stage of the acquisition of *wh*-questions (e.g., a child Turkish learner in Haznedar (2003), 11-12 years old French learners in

Spada and Lightbown (1999), and adult Japanese learners in Sakai (2008)). As illustrated in (1), which are speech data from Erden in Haznedar (2003), auxiliary *be* can remain uninverted, and can drop, while *do* usually does not appear (and the main verb can be overtly inflected) in non-inverted *wh*-questions.

- (1) a. What you're saying?  
b. What you doing here?  
c. What I get here?

It may be that L2 learners go through a similar (not fundamentally different) developmental stage as L1 children, where their grammar has a parameter setting of neither L1 nor L2. To explore this possibility, however, it must first be clarified whether L2 learners demonstrating inconsistent inversion show an asymmetry between *why* and argument *wh*-questions regarding the lack of inversion. The purpose of the present study is to offer an answer to this question.

## 2. Previous L2 research on Non-Subject *Wh*-Questions

Lee (2008) is the first attempt to show that L2 English learners show such an asymmetry. She conducted a grammaticality judgment task with 41 adult Korean learners as participants, and reports that for the uninverted (i.e., ungrammatical) *wh*-questions, the mean score of *what* (-0.54) was significantly lower than those of *who* (-0.48), *how* (-0.09), and *why* (-0.00),<sup>2</sup> and that significant differences were also found between *who* and *how*, and between *who* and *why*, but not between *how* and *why*. She argues that the asymmetry between arguments and adjuncts supports the generative syntactic approach because it did not accord with the results of an input analysis for Korean learners.

However, the asymmetry found in her study is based on perception data, while the one reported in L1 studies is on production data. They may be essentially the same, but this has not been confirmed. In fact, the participants, who were advanced learners of English, may have past the stage of producing non-inverted *wh*-questions by the time of the investigation.

To collect L2 production data, Yokoyama (2009) administered a translation task to 17 adult Japanese learners of English, and reported an asymmetry

between argument and adjunct *wh*-questions. Although the task contained only three test items for each *wh*-phrase, the mean rates of inversion in *what*, *who*, *how*, and *why* questions were 0.61, 0.61, 0.47, and 0.39 respectively. According to Kanai's (2014) later input analysis for Japanese learners, the frequencies of *wh*-questions excluding formulaic expressions such as *how are you?* and those that contain *you* as the subject were as follows: *what* (321) > *how* (97), *why* (90) > *who* (19).<sup>3</sup> These results, which were essentially the same as those in Lee (2008), were reportedly not compatible with Yokoyama's (2009) results.

To summarize, L2 learners seem to accept or produce non-inverted *why* questions more than non-inverted *what* and *who* questions. Furthermore, there may be little difference between *what* and *who* questions without inversion, although *what* questions are much more frequent than *who* questions in L2 input.

The previous findings are limited, but are important in several respects. First, the data on which they are based are from L2 learners whose L1 has no inversion. Both Korean and Japanese, unlike languages such as French, do not show optional inversion in *wh*-questions. Thus, we can exclude the possibility that the asymmetry itself would be affected by L1.

Second, Lee (2008) and Yokoyama (2009) are both experimental studies, where the number and kind of *wh*-phrases and subjects were controlled. Thus their data can be considered as more balanced than naturalistic data, and hence as less affected by noises unrelated to L2 grammar.

However, stronger evidence for the asymmetry is necessary to discuss the question of whether L2 learners structurally distinguish between *why* and arguments in the acquisition of inversion of *wh*-questions.

### 3. Predictions

The syntactic account and the input frequency account make different predictions concerning the lack of inversion in *why* questions and questions with *what* and *who* in the object (i.e., argument) position. The frequency rank order should be '*why*>*what*, *who*' under the former account, while it should be '*who*>*why*>*what*' under the latter account. The crucial difference is between *who* and *what*. The syntactic account predicts that the rate of non-inversion in *who* questions would not be significantly different from that in *what* questions, since both of the two *wh*-phrases originate in the complement position of a verb. On

the other hand, the input frequency account predicts that the former would be significantly higher than the latter, because inverted *what* questions are more frequent than inverted *who* questions.

## 4. The Current Study

### 4.1. Participants

65 Japanese speakers learning English at a university in Niigata, Japan, participated in this study. One had lived in Singapore for three years, and was removed from data. As for the remaining 64 (18-22 years old), no one had experience of staying in a country where English is spoken for more than two weeks. Their mean length of studying English was 8.65 years.

### 4.2. Task

A self-paced translation task was used to elicit *wh*-questions. It was administered to the participants individually. After two warm-up trials, they orally translated Japanese sentences projected on a computer screen one by one into English, which were audio-recorded and were later transcribed.

The task consisted of 18 test items and 21 fillers, which were presented in a semi-randomized order. Each participant translated the designated part in each item into English as in (2)-(4), where targets are in bold face:

- (2) Tasika anata-wa sakihodo made Miki to Ayaka to issho desita yone.  
maybe you-Top a while ago until Miki and Ayaka with were TagQ  
'You were with Miki and Ayaka until a while ago, right?'  
Kanojotati-wa kyositu-de nani-o tukut-teita-no desu ka?  
she(Pl)-Top classroom-in what-Acc making were Q  
**'What were they making in the classroom?'**
- (3) Tasika anata-wa sakihodo made Kate to Airi to issho desita yone.  
maybe you-Top a while ago until Kate and Airi with were TagQ  
'You were with Kate and Airi until a while ago, right?'  
Kanojotati-wa ima-de naze warat-teita-no desu ka?  
she(Pl)-Top livingroom-in why laughing were Q  
**'Why were they laughing in the living room?'**
- (4) Tasika anata-wa sakihodo made Diana to Karen to issho desita yone.

maybe you-Top a while ago until Diana and Karen with were TagQ  
 ‘You were with Diana and Karen until a while ago, right?’  
Kanojotati-wa daidokoro-de dare-o tetuda-teita-no desu ka?  
 she(Pl)-Top kitchen-in who-Acc helping were Q  
 ‘Who were they helping in the kitchen?’

The test items were constructed in such a way that each target sentence would include one of the three *wh*-phrases (*why*, *what*, and *who*) and one of 6 *do/be* forms (see Appendix 1 for the list of the target sentences).

### 4.3. Data Analysis

*Wh*-questions were regarded as inverted if they started with the sequence of *wh*-phrase+auxiliary+subject as in (5), and as non-inverted if they started with a sequence of *wh*-phrase+subject as in (6) (cf. (1)).

- (5) a. What does the boy study every day?  
 b. What are the boy study every day?
- (6) a. Why that children are jumping on the bed?  
 b. Why the children jumping on the bed?  
 c. Why the children jump on the bed?  
 d. Why the kids jumped on the bed?

Those in which the presence of an auxiliary in the sequence of *wh*-phrase+auxiliary+subject was not clear were not counted. Furthermore, those containing non-object *what/who* as in (7) were not counted either, while those having *what*+N as in (8) were counted as *what* questions because the fronted *wh*-phrase is originally an object as in other *what* questions.

- (7) a. What is the book the children read in the library?  
 b. Who is that person Bob introduced?
- (8) a. What things did they make at classroom?  
 b. What things they often eat?

Repetitions were excluded from the data. As for self-corrections, however,

those starting with a *wh*-phrase and lacking inversion either at the beginning as in (9a) or in the rephrased part as in (9b) were regarded as having non-inversion.

- (9) a. Why the boy cries ...Why does the boy cry every night?  
b. Who does Nancy...Who Nancy touch with this glove?

#### 4.4 Results

Out of 64 participants, 23 produced more than one *wh*-question without inversion and more than one *wh*-question with inversion, and were considered as learners having optional inversion.

As for these 23 participants, the mean proportions of non-inverted questions to the total number of inverted and non-inverted questions were 0.53 ( $SD=0.26$ ) in *why* questions, 0.28 ( $SD=0.30$ ) in *what* questions, and 0.27 ( $SD=0.33$ ) in *who* questions (see Appendix 2 for the individual results). A one-way analysis of variance (ANOVA) showed a significant main effect of question type ( $F(2, 44)=9.22$ ,  $p<.01$ ). Further analysis with Bonferroni revealed that the mean non-inversion rate was significantly higher in *why* questions than in *what* and *who* questions, but no significant difference was found between *what* and *who* questions.

These results of *what* and *who* questions made an intriguing contrast with the results concerning *wh*-movement between the two types: 109 (79%) *what* questions out of all trials were judged as involving *wh*-movement (from the object position), while 70 (51%) *who* questions were considered as involving *wh*-movement. A Chi-square analysis revealed that *wh*-movement occurred significantly more frequently in *what* questions, and significantly less frequently in *who* questions ( $\chi^2(1, N=276)=22.95$ ,  $p<.01$ ).

As for the non-inverted questions, however, closer scrutiny is needed to obtain more reliable results. As is well-known, L2 learners often omit inflection of a verbal element and drop an auxiliary as in (6b) (see Prévost and White (1999, 2000)). Therefore, non-inverted questions without overt inflection such as (6b, c) can be given another interpretation: an auxiliary is phonologically null, is present structurally, and occupies the position of C. Thus such non-inverted questions may have been 'with inversion'. To exclude the possibility and to test whether the asymmetry can be maintained, the number of non-inverted questions with overt inflection such as (6a, d) was calculated. The results are shown in Table 1.

Table 1. Number (%) of Inverted Questions and Non-Inverted Questions

	Inverted	Non-inverted		Total
		With overt inflection	Without overt inflection	
<i>why</i>	62 (47%)	13 (10%)	57 (43%)	132 (100%)
<i>what</i>	85 (75%)	4 (4%)	24 (21%)	113 (100%)
<i>who</i>	52 (72%)	3 (4%)	17 (24%)	72 (100%)

The number of non-inverted questions was largest in *why* questions irrespective of whether they were with overt inflection or not. However, it was small in *what* and *who* questions. A Chi-square analysis revealed that non-inversion occurred significantly more frequently both in *why* questions with overt inflection and in those without overt inflection ( $\chi^2(4, N=317)=24.67, p<.01$ ).

## 5. Discussion and Conclusion

The results in the previous section indicate that there is an asymmetry between *why* and argument *wh*-questions in L2 as the syntactic account predicts: *why* > *what*, *who*. Thus the syntactic account is supported: non-inversion occurs more frequently in *why* questions than in *what* and *who* questions because *why* is a sentential adverb, may stay in the original adjunct position for some reason, and hence often fails to move to the sentence-initial position for *wh*-phrases (possibly in [SPEC, CP]). This account, however, amounts to saying that the source of the asymmetry is frequent lack of *wh*-movement in *why* questions.

On the other hand, a difference was found between *what* and *who* questions with respect to the frequency of *wh*-movement. This may reflect L2 input. If so, it would be implausible that only *why* questions are not affected.

In sum, the overall results suggest that the acquisition of *wh*-movement involves various factors, one of which is syntactic and relates to the lack of inversion in *why* questions, and that *wh*-movement triggers T to C movement (i.e., inversion) at a constant rate, at least in *what* and *who* questions, and probably in all *wh*-questions.

In conclusion, L2 learners may go through a similar developmental stage as L1 learners in the acquisition of inversion of *wh*-questions. However, more research will be necessary to address the question of whether it is fundamentally the same.

## Notes

\*I would like to thank Tetsuya Sano and other TPL members for their helpful comments. Thanks also go to Ivan Brown, who proofread this paper, and the undergraduate students who readily participated in this study.

1. The results in Ambridge and Rowland (2006) are exceptional in this respect.
2. The maximal and minimal values of the scale used were +2 and -2 respectively.
3. > stands for 'significantly larger in number.'

## References

- Ambridge, Ben and Caroline F. Rowland (2006) "Comparing Different Accounts of Inversion Errors in Children's Non-Subject *Wh*-Questions: What Experimental Data can Tell us?" *Journal of Child Language* 33, 519-557.
- Berk, Stephanie (2003) "Why "Why" is Different," *Proceedings of the 27th Boston University Conference on Language Development*, ed. by Barbara Beachley, Amanda Brown, and Frances Conlin, 127-137, Cascadilla Press, Somerville, MA.
- De Villies, Jill (1991) "Why Questions?" *Papers in the Acquisition of Wh: Proceedings of UMass Roundtable, May 1990*, ed. by Thomas L. Maxfield and Bernadette Plunkett, 155-173, GLSA Publications, Amherst, MA.
- Erreich, Anne (1984) "Learning How to Ask: Patterns of Inversion in Yes-no and *Wh*-questions," *Journal of Child Language* 11, 579-592.
- Haznedar, Belma (2003) "The Status of Functional Categories in Child Second Language Acquisition: Evidence from the acquisition of CP," *Second Language Research* 19, 1-41.
- Kanai, Takuma (2014) *Nihonjin-Eigo-Gakushusha no Wh-Gimonbun no Kakutoku: Input-Hindo-Setsu no Kensho* (The Acquisition of *Wh*-Questions by Japanese Learners of English: Testing an Input Frequency Approach). Graduation Thesis, Joetsu University of Education.
- Labov, William and Teresa Labov (1978) "Learning the Syntax of Questions," *Language Development and Mother-Child Interaction*, ed. by Robin N. Campbell and Philip T. Smith, 1-44, Plenum Press, New York.
- Lee, Sun-Young (2008) "Argument-Adjunct Asymmetry in the Acquisition of Inversion in *Wh*-Questions by Korean Learners of English," *Language*



*Learning* 58, 625-663.

- Prévost, Philippe and Lydia White (1999) "Accounting for Morphological Variation in Second Language Acquisition: Truncation or Missing Inflection?" *The Acquisition of Syntax*, ed. by Marc-Ariel Friedemann and Luigi Rizzi, 202-235, Longman, London.
- Prévost, Philippe and Lydia White (2000) "Missing Surface Inflection or Impairment in Second Language Acquisition?: Evidence from Tense and Agreement," *Second Language Research* 16, 103-133.
- Rizzi, Luigi (1990) *Relativized Minimality*, MIT Press, Cambridge, MA.
- Rowland, Caroline F., and Julian M. Pine (2000) "Subject-Auxiliary Inversion Errors and *Wh*-Question Acquisition: What Children do Know?" *Journal of Child Language* 27, 157-181.
- Rowland, Caroline F., and Julian M. Pine (2003) "The Development of Inversion in *Wh*-questions: A Reply to Van Valin," *Journal of Child Language* 30, 197-212.
- Sakai, Hideki (2008). "An Analysis of Japanese University Students' Oral Performance in English Using Processability Theory," *System* 36, 534-549.
- Spada, Nina and Patsy M. Lightbown (1999) "Instruction, First Language Influence, and Developmental Readiness in Second Language Acquisition," *The Modern Language Journal* 83, 1-22.
- Stromswold, Karin (1990) *Learnability and the Acquisition of Auxiliaries*. Unpublished doctoral dissertation, MIT, Cambridge, MA.
- Thornton, Rosalind (2008) "Why Continuity," *Natural Language and Linguistic Theory* 26, 107-146.
- Yokoyama, Ayumi (2009) *Nihonjin-Eigo-Gakushusha niyoru Gimobun no Kakutoku: Kou to Fukabu no Kubetsu nitsuite (The Acquisition of Questions by Japanese Learners of English: On the Argument-Adjunct Distinction)*. Graduation Thesis, Joetsu University of Education.

#### Appendix 1. List of Target Sentences

- (1) a. What do they eat often?
  - b. Why do they get up early?
  - c. Who do they know well?
- (2) a. What does the boy study every day?
  - b. Why does the boy cry every night?

- c. Who does the boy meet every morning?
- (3) a. What did Nancy draw with the pencil?  
 b. Why did Nancy run with the shoes?  
 c. Who did Nancy touch with the glove?
- (4) a. What are the children reading in the library?  
 b. Why are the children jumping on the bed?  
 c. Who are the children chasing in the park?
- (5) a. What is Bob cooking in the kitchen?  
 b. Why is Bob swimming in the pool?  
 c. Who is Bob introducing in the restaurant?
- (6) a. What were they making in the classroom?  
 b. Why were they crying in the living room?  
 c. Who were they helping in the kitchen?

Appendix 2. Number (%) of Non-Inverted *Wh*-Questions (Individual Results)

Participants	<i>why</i>		<i>what</i>		<i>who</i>	
1	3/6	(50%)	1/6	(17%)	0/3	(0%)
2	6/6	(100%)	1/6	(17%)	1/2	(50%)
3	4/6	(67%)	2/5	(40%)	1/5	(20%)
4	1/2	(50%)	1/3	(33%)	0/0	(0%)
5	6/6	(100%)	2/2	(100%)	2/3	(67%)
6	6/6	(100%)	0/6	(0%)	3/3	(100%)
7	1/6	(17%)	3/6	(50%)	4/4	(100%)
8	3/6	(50%)	0/6	(0%)	0/4	(0%)
9	2/5	(40%)	2/3	(67%)	0/2	(0%)
10	2/6	(33%)	1/5	(20%)	0/5	(0%)
11	2/6	(33%)	0/6	(0%)	0/5	(0%)
12	4/6	(67%)	4/6	(67%)	1/2	(50%)
13	3/5	(60%)	0/3	(0%)	1/2	(50%)
14	2/6	(33%)	0/3	(0%)	0/0	(0%)
15	6/6	(100%)	1/2	(50%)	4/6	(67%)
16	3/6	(50%)	4/6	(67%)	1/2	(50%)
17	2/6	(33%)	0/6	(0%)	0/6	(0%)
18	4/6	(67%)	4/5	(80%)	1/2	(50%)
19	1/6	(17%)	0/6	(0%)	1/6	(17%)
20	2/6	(33%)	0/5	(0%)	0/6	(0%)
21	1/6	(17%)	1/6	(17%)	0/4	(0%)
22	4/6	(67%)	0/5	(0%)	0/0	(0%)
23	2/6	(33%)	1/6	(17%)	0/0	(0%)