1 Introduction

A large number of grammar acquisition studies in recent years have convincingly shown that many properties of the allegedly biologically determined Universal Grammar (UG) constrain grammar acquisition from a very early age (see e.g. Crain 1991, Otsu 1981, Wexler 1994). A natural prediction to be drawn from this observation is that the constructions which are generated by the interactions of various modules of UG should also emerge early. One such construction is the passive construction (Boeckx 1998, Chomsky 1981, Baker, et al. 1989, Jaeggli 1986). Several experimental studies have tested this prediction with respect to the acquisition of passives in English (e.g. Maratsos, et al. 1985, Pinker, et al. 1987). However, the prediction was not borne out; it was found that children seem to have difficulty in comprehending full passives (i.e. passives with by-phrase). To account for these observations, Borer and Wexler (1987, 1992) proposed that young children do not have the ability to form A-chains, and that this ability is maturationally controlled (and does not emerge until around the age of four or so).

Borer and Wexler’s Maturation of A-chain Hypothesis (hereafter, MAH) has been tested in various studies. The results of these studies are not uniform; some of them support the hypothesis (Babyonyshev, et al. 1998, Pierce 1992), while others do not (Demuth 1989, Fox and Grodzinsky 1998, Snyder et al. 1995). Thus, to determine the precise nature of the relevant late-emerging property, it is still necessary to put this hypothesis to further empirical tests.

This paper is an attempt to investigate experimentally how children acquire passive constructions in Japanese. Specifically, the present study has two goals. First, it aims to provide experimental data with respect to the acquisition of Japanese passives. Second, it tests the prediction of MAH. Namely, it is tested whether the passives without A-chains are acquired earlier than those with A-chains. The results show that the prediction of MAH is actually the case.

* I would like to thank Miwa Isobe for her enormous cooperation in all stages of the experiment. I am grateful to the teachers and children of Yamanashi Eiwa Yoochien who participated in my experiment. I would also like to thank Sachiko Kondo for her cooperation in the pilot stage. Furthermore, I am grateful to Diane Lillo-Martin, Masaru Kajita, Nobuhiro Miyoshi, Howard Lasnik, Yukio Otsu, Tom Roeper, Tetsuya Sano, William Snyder, and Ken Wexler for their valuable comments. The usual disclaimers apply.
2 Japanese Passives

There are a large number of studies on the analysis of Japanese passives. In the present study, I adopt the analysis by Kubo (1990), which covers a wide range of data in Japanese passives.

Traditionally, Japanese has been assumed to have two types of passives: “direct passive” as in (1) and “indirect passive” as in (2):

(1) sensei-ga seito-ni ker-are-ta.
   teacher-NOM pupil-BY kick-PASS-PAST
   ‘The teacher was kicked by the pupil.’

(2) a. sensei-ga seito-ni kuruma-o ker-are-ta.
    teacher-NOM pupil-BY car-ACC kick-PASS-PST
    ‘The teacher is such that his car was kicked by the pupil.’
 b. sensei-ga seito-ni nak-are-ta.
    teacher-NOM pupil-BY cry-PASS-PST
    ‘The teacher is such that his pupil cried.’ (Washio 1989/90: 227)

The former has generally been characterized as passive sentences which have active counterparts. The latter has the following properties (Washio 1989/90: 227):

(3) a. Its verb has the usual passive morpheme.
 b. It has a clear passive sense.
 c. It contains a nominative NP.
 d. The passive verb may be transitive or intransitive.
 e. The direct object, if there one, surfaces as such.
 f. It is typically, though not always, associated with “adversity interpretation”,
    i.e., the clause-initial nominative element is interpreted as being adversely
    affected by the state of affairs expressed in the rest of the clause.

Kubo (1990) recategorizes these two types into passives with gaps and those without gaps, with the former further subcategorized into three types. The whole picture is given in (4), and an example of these passives is given in (5):

(4) gap? previous category
    accusative passive yes direct passive
    gapped passive dative passive yes direct passive
    gapless passive possessive passive yes indirect passive
    gapless passive no indirect passive

---

In my experiment, the acquisition of accusative passives and gapless passives is investigated. In Kubo’s analysis, both of these passives are generated by the interaction of principles of UG, and the only information that should be “learned” by children is the properties of passive morpheme (r)are. She argues that one of the crucial differences between these two types of passives is, while the former involves movement of NP from object position to subject position, the latter does not involve this movement in its derivation. Namely, accusative passives involve A-chains, but gapless passives do not.²

One piece of evidence for this structural difference can be drawn from Miyagawa (1988, 1989). Miyagawa observes that for a numeral quantifier to float, the numeral quantifier and the NP it modifies must mutually c-command, as shown below (Miyagawa 1988: 134-5):

(6) a. Tomodachi-ga futari Shinjuku-de [VP Tanaka-sensei-ni atta.]
   friends-NOM 2-cl Shinjuku-in Prof. Tanaka-DAT met
   ‘Two friends met Prof. Tanaka in Shinjuku.’

b. *Tomodachi- ga Shinjuku-de [VP Tanaka-sensei-ni futari atta.]
   friends-NOM Shinjuku-in Prof. Tanaka-DAT 2-cl met
   ‘Two friends met Prof. Tanaka in Shinjuku.’

(7) *[NP Tomodachi-no kuruma]-ga san-nin koshooshita.
   friends-GEN car NOM 3-cl broke down.
   ‘Three friends’ cars broke down.’

Interestingly, this “quantifier float” is possible from the surface subject of accusative passives, but not possible from that of gapless passives:

---

² Kubo (1990) adopts the VP-internal subject hypothesis and assumes that the gapless passives have an A-chain between the specifier of IP and the specifier of VP. I crucially assume that the chain between these positions, which is formed in every transitive and unergative sentence, does not undergo maturation. See Babyonyshev et al. (1998) for the discussion on this point.
(8) Accusative passive:
Yuube, kuruma-ga [\text{VP} doroboo-ni ni-dai nusum-are-ta.]
last night car-NOM theif-by 2-cl steal-PASS-PAST
‘Last night, two cars were stolen by a theif.’

(9) Gapless passive
*Kodomo-ga [\text{VP} ame-ni futari fur-are-ta.]
children-NOM rain-by 2-cl fall-PASS-PAST
‘Two children were rained on.’

Miyagawa argues that this contrast can be captured if the mutual c-command requirement is assumed to be satisfied between the numeral quantifier and the trace coindexed with the surface subject. Kubo incorporates this observation and assumes that accusative passives involve movement of NP from object position to subject position, while gapless passives do not.

Then, if Kubo’s analysis is correct in that accusative passives involve A-chains while gapless passives do not, and also if Borer and Wexler’s MAH is actually the case, gapless passives will be acquired earlier than accusative passives. This is the prediction tested in my experiment.

3 Production Data

First of all, in order to know whether Japanese-speaking children produce passives in naturalistic contexts, I analyzed the Japanese data available on CHILDES (MacWhinney and Snow 1985, 1990).

I have found only two utterances of passive, both of which are accusative passive with the verb “okorareru” (‘be scolded’):

(10) (AKI: the child; AMO: Aki’s mother)
AMO: Ree-chan, kitaradame.
AMO: okorareru yo.
AKI: okoreru@n [: okoru-rareru]? ‘be scolded?’
AMO: okorareru.
AKI: n? ‘n?’

(Aki 2;9, file 43)

(11) AMO: soko iku to ne ‘Yes, if go there, Aki will get angry’
# Aki-chan okoru ne. [=!laughing].

(Aki 2;9 file 43)

As is clear form (10), the child produced these passives by imitating the preceding mother’s utterance. Thus, it is far from obvious whether these utterances reflect the child’s knowledge of accusative passives. In addition, the number of utterances of passives is quite small. These facts strongly motivate the necessity of the experiment, which is reported in the next section.
4 The Experiment

4.1 Hypotheses and Predictions

Adopting Kubo’s (1990) analysis, I assume the following:

(12) Accusative passives involve A-chains, while gapless passives do not.

Next, I assume Borer and Wexler’s MAH:

(13) The ability to form A-chain matures.

Then, the prediction will be as follows:

(14) Gapless passives are acquired earlier than accusative passives.

More specifically, the following is expected:

(15) There are logically four types of children:
   Type A: those who have acquired neither gapless passives nor accusative passives;
   Type B: those who have acquired gapless passive but not accusative passives;
   Type C: those who have acquired accusative passives but not gapless passives;
   Type D: those who have acquired both gapless and accusative passives.
   All the subjects should fall in either Type A, B, or D (hence, no Type C subjects).

If the prediction in (15) is confirmed, then the hypotheses (12) and (13) are supported.

4.2 Subjects

20 monolingual Japanese-speaking children were tested. 3 of them were three-year olds, 9 were 4-year olds, and 8 were five-year olds. The mean age of the subject is 5;0 (five years old). Each subject was tested individually by a experimenter who is a native speaker of Japanese. The experiment took about ten minutes for each subject.

4.3 Method

The task is a two-choice picture identification. Each subject is shown two pictures, and asked to point out the picture that matches the test sentence. In one picture, the action described by the test sentence is depicted correctly, while in the other the agent and the patient (or the malefactive) are reversed. The test sentences consist of 2 intransitive sentences for practice, 4 active transitive sentences for control, 4 gapless passives, and 4 accusative passives. Thus, the total number of the test sentences is fourteen. The order of these sentences is randomized from child to child. The list of test sentences is given in the Table 2 of the Appendix. An example of each test sentence is given below:
(16) Active Transitive
Yuuenchi ni kitsune-san ga imashita.
amusement park in a fox NOM is-POL-PAST
Sono kitsune-san ga buta-san o kusugurimashita.
the fox NOM pig ACC tickle-POL-PAST
‘There was a fox in the amusement park. The fox tickled a pig.’

(17) Gapless Passive
Kooen ni usagi-san ga imashita.
park in rabbit NOM is-POL-PAST
Sono usagi-san ga buta-san ni nigeraremashita.
the rabbit NOM pig by escape-PASS-POL-PAST
‘There was a rabbit in the park. A pig ran away, which affected the rabbit.’

(18) Accusative Passive
Yoochien-ni osaru-san ga imashita.
kindergarten in monkey NOM is-POL-PAST
Sono-osarusan ga neko-san ni hikkakaremashita.
the monkey NOM cat by scratch-PASS-POL-PAST
‘There was a monkey in the park. The monkey was scratched by a cat.’

Notice that each test sentence is presented with discourse. The sentence that precedes the test sentence establishes the subject of the following passive sentence as a discourse topic, which makes the use of passive sentence natural. As Otsu (1994) points out in his experiment on the acquisition of scrambling, children are quite sensitive to such a subtle discourse factor. I incorporated his observation into my experiment so that children’s responses were not biased by discourse factors.

4.4 Results

Among the 20 subjects, one subject could not finish the experiment. Since we need some evidence that children are actually attending to the experimental items, we excluded from further analysis those subjects who judged fewer than three of the four active transitive sentences correctly. Two children failed to meet this criterion. Thus, I analyzed the data of the remaining 17 children. The criterion for passing each of the accusative passives and the gapless passives is to get at least three answers correct out of four. The results are summarized in Table 1:

<table>
<thead>
<tr>
<th>Gapless Passives</th>
<th>Accusative Passives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>6</td>
</tr>
<tr>
<td>Fail</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1
The number of the children who passed/failed the accusative passive test and/or the gapless passive test
As can be seen from Table 1, six subjects fell in Type A, four subjects in Type B, six subjects in Type D; only one subject fell in Type C\(^3\). As for the individual subject responses and subject ages, see Table 3 and 4 in the Appendix.

4.5 Discussion

The results of my experiment are in conformity with the prediction given in (15); almost all children fell in Type A, B, or D, and only one child fell in Type C. Namely, it is shown that Japanese-speaking children acquire gapless passives earlier than accusative passives. These results in turn supports the hypotheses given in (12) and (13); accusative passives, but not gapless passives, involve A-chains in their derivation, and the ability to form A-chains is maturationally controlled. Thus, children’s acquisition of Japanese passives provides another piece of evidence for Borer and Wexler’s MAH.

5 Conclusion

It has been shown experimentally that Japanese-speaking children acquire gapless passives earlier than accusative passives, which is in conformity with the prediction of MAH\(^4\). The results are still preliminary in that there were a relatively small number of subjects and test items, but I believe that these results constitute an important first step toward understanding the nature of passive acquisition in Japanese.

\(^3\) The fact that relatively large number of children fell in Type A needs to be explained. I conjecture that passives are rare in the parental input, and hence it is difficult for children to identify the property of passive morpheme in Japanese.

\(^4\) Interestingly, Hagiwara (1993) reports that Japanese-speaking aphasic patients have trouble comprehending accusative passives, but not gapless passives. Then, Hagiwara’s results and the results presented in this paper are in conformity with the general observation that language acquisition and language loss constitutes a mirror image.
## Appendix

### Table 2
List of Test Sentences

1. **Active Intransitives (Practice)**
   - A. Kooen ni butasan ga imashita. ‘There was a pig in the park.
     - Sono butasan ga jumpu-shimashita. ‘The pig jumped.’
   - B. Yuuenchi ni kumasan ga imashita. ‘There was a bear in the amusement park.
     - Sono kumasan ga waraimashita. ‘The bear laughed.’

2. **Active Transitives (Control)**
   - A. Yoochien ni kitsunesan ga imashita. ‘There was a fox in the kindergarten.
     - Sono kitsunesan ga butasan o kusugurimashita. ‘The fox tickled a pig.’
   - B. Yuuenchi ni osarusan ga imashita. ‘There was a monkey in the amusement park.
     - Sono osarusan ga kumasan o waraimashita. ‘The monkey laughed.’
   - C. Yuuenchi ni raionsan ga imashita. ‘There was a lion in the amusement park.
     - Sono raionsan ga usagisan o kusugurimashita. ‘The lion pushed a rabbit.’
   - D. Yuuenchi ni nekosan ga imashita. ‘There was a cat in the amusement park.
     - Sono nekosan ga kitsunesan o kamimashita. ‘The cat bit a fox.’

3. **Accusative Passive**
   - A. Yuuenchi ni kitsunesan ga imashita. ‘There was a fox in the amusement park.
     - Sono kitsunesan ga butasan ni butaremashita. ‘The fox was patted by a pig.’
   - B. Yoochien ni inusan ga imashita. ‘There was a dog in the kindergarten.
     - Sono inusan ga usagisan ni oikakeraremashita. ‘The dog was chased by a rabbit.’
   - C. Kooen ni osarusan ga imashita. ‘There was a monkey in the park.
     - Sono osarusan ga nekosan ni hikkakaremashita. ‘The monkey was scratched by a cat.’
   - D. Kooen ni kumasan ga imashita. ‘There was a bear in the park.
     - Sono kumasan ga osarusan ni hippararemashita. ‘The bear was pulled by a monkey.’

4. **Gapless Passive**
   - A. Kooen ni usagisan ga imashita. ‘There was a rabbit in the park.
     - Sono usagisan ga butasan ni nigeraremashita. ‘A pig ran way, which affected the rabbit.’
   - B. Kooen ni inusan ga imashita. ‘There was a dog in the park.
     - Sono inusan ga kumasan ni nakaremashita. ‘A bear cried, which affected the dog.’
   - C. Yoochien ni raionsan ga imashita. ‘There was a lion in the kindergarten.
     - Sono raionsan ga osarusan ni kusyamisaremashita. ‘A monkey sneezed, which affected the lion.’
   - D. Yoochien ni kitsunesan ga imashita. ‘There was a fox in the kindergarten.
     - Sono kitsunesan ga nekosan ni onarasaremashita. ‘A cat broke wind, which affected the fox.’
Table 3
Ages of Subjects

<table>
<thead>
<tr>
<th>Type A Subjects</th>
<th>Type B Subjects</th>
<th>Type C Subjects</th>
<th>Type D Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Age</td>
<td>Age</td>
<td>Age</td>
</tr>
<tr>
<td>1 4;4</td>
<td>1 3;10</td>
<td>1 4;5</td>
<td>1 4;6</td>
</tr>
<tr>
<td>2 4;4</td>
<td>2 3;11</td>
<td></td>
<td>2 4;10</td>
</tr>
<tr>
<td>3 4;8</td>
<td>3 4;8</td>
<td></td>
<td>3 5;5</td>
</tr>
<tr>
<td>4 4;10</td>
<td>4 5;8</td>
<td></td>
<td>4 5;6</td>
</tr>
<tr>
<td>5 5;4</td>
<td></td>
<td></td>
<td>5 5;7</td>
</tr>
<tr>
<td>6 5;8</td>
<td></td>
<td></td>
<td>6 5;10</td>
</tr>
<tr>
<td>mean age 4;10</td>
<td>mean age 4;6</td>
<td>mean age 5;3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4;4</td>
</tr>
<tr>
<td>2</td>
<td>4;4</td>
</tr>
<tr>
<td>3</td>
<td>4;8</td>
</tr>
<tr>
<td>4</td>
<td>4;10</td>
</tr>
<tr>
<td>5</td>
<td>5;4</td>
</tr>
<tr>
<td>6</td>
<td>5;8</td>
</tr>
</tbody>
</table>

Table 3
Ages of Subjects

<table>
<thead>
<tr>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
<th>Type D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>Age</td>
<td>Subjects</td>
<td>Age</td>
</tr>
<tr>
<td>1</td>
<td>4;4</td>
<td>1</td>
<td>3;10</td>
</tr>
<tr>
<td>2</td>
<td>4;4</td>
<td>2</td>
<td>3;11</td>
</tr>
<tr>
<td>3</td>
<td>4;8</td>
<td>3</td>
<td>4;8</td>
</tr>
<tr>
<td>4</td>
<td>4;10</td>
<td>4</td>
<td>5;8</td>
</tr>
<tr>
<td>5</td>
<td>5;4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5;8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean age 4;10</td>
<td>mean age 4;6</td>
<td>mean age 5;3</td>
<td></td>
</tr>
</tbody>
</table>
Table 4
Individual Subject Responses

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
<th>Type D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6</td>
<td>1 2 3</td>
<td>1 2 3 4 5 6</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>Active Intransitives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1A</td>
<td>C @ C @ C C C C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1B</td>
<td>C C C C C C C C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Transitives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2A</td>
<td>C C C C C C C C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2B</td>
<td>C C C C C C C C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2C</td>
<td>C C C C C W C C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D</td>
<td>C C C C C C W C C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accusative Passive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B</td>
<td>C C W C W W W C W C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C</td>
<td>W C C W C C W W W W W W W W</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3D</td>
<td>W W W C W W W W W W C C C C</td>
<td>C C C C W C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gapless Passive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4A</td>
<td>C C W W C W C C C C C C C C</td>
<td>C C W C W C W C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4B</td>
<td>W W W W W W W W C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4C</td>
<td>C W C C C W C W C C C C C C</td>
<td>C C C C C C C C C C C C C C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4D</td>
<td>W W W C W C C W W W W W W</td>
<td>C W C C C C C W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C: correct answer  W: wrong answer  @: the subject could not answer
References


(koji.sugisaki@uconn.edu)