COMPREHENSION OF SENTENCES WITH GIVING AND RECEIVING VERBS IN JAPANESE CHILDREN*

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1. Introduction

Comprehension of sentences requires not only the knowledge of the grammar of a language but also the use of certain processing devices which effectively map surface syntactic information onto semantic representation rather directly in real-time situations. Following T. G. Bever (1970), we will call these devices "perceptual strategies."

Our past study with normal adults as subjects (Uyeno and Harada (1975)) revealed the role of perceptual strategies as canonizing surface information into the format of a template, with the form of <u>Subject-Adverb-Object-Verb</u>.

Previous studies (Hayashibe (1975) and Sano (1977)) demonstrated the possibility of recapitulating the development of simple sentence comprehension in terms of acquisition of perceptual strategies. It has been observed that children come to incorporate the following three classes of sentences into the repertory of manageable sentences in the order given:

   (i) irreversible sentences,
  (ii) normal word order reversible sentences, and
 (iii) inverted word order reversible sentences.

From the view point of perceptual strategy, this tendency is best accounted for by assuming that children acquire the following perceptual strategies in the order specified:

   (i) semantic strategy,
  (ii) SOV strategy, and
 (iii) particle strategy.

Semantic strategy solely depends on the semantic information of nouns and verbs involved in the given sentence. SOV strategy utilizes the information of the word order. Particle strategy uses the information of the Japanese particles in such a way that -<u>ga</u> indicates the subject, -<u>o</u> indicates the object, and so on. Therefore, it has been claimed that the strategies which utilize language specific cues (such as particles in Japanese) are acquired at a later stage of development than those strategies that depend on language universal features such as word order.

As the next stage of the inquiry, we advanced our study to examine the mechanisms involved in the comprehension of complex sentences (specifically, relative clauses and conjunctions) (Harada, et al. 1976; Uyeno, et al. 1977). They revealed the developmental trends in different types of relative clause constructions, and the major strategies used in comprehending them. The following shows the order of easiness in comprehension (and thus also the developmental order).

a. conjunction construction: [N-ga N-o V-te] [N-o V-ta]

b. left-branching construction: [[N-ga/o V-ta]N-ga N-o V-ta]

c. center-embedding construction: [N-ga [N-ga/o V-ta]N-o V-ta]

The difference in surface structure of relative clause constructions affects comprehension considerably. Center-embedding constructions were much harder to acquire than left-branching constructions, irrespective of the function of the head nouns.

Essentially, the strategies used in the comprehension for relative clause constructions (and conjunctions) are the same, but we must assume a different process for detecting clause boundaries. Many instances of misinterpretation of relative clause constructions for conjunctions in earlier ages indicate that the SOV or similar strategy functions to identify the clause.

Conjunction may contain a gap in the second clause in identity to a noun in the first clause, whereas relative clause construction always contains a gap in the relative clause that is identical to the head noun. Therefore, we must assume another strategy which fills the gap in the complement sentence.

Based on the findings summarized above, we conducted three experiments in order to study the mechanisms of the comprehension of the so-called complement constructions other than relative clauses. This year, we limited our attention to the comprehension of sentences with giving and receiving verbs in Japanese. There are three reasons why we chose these constructions. The first reason is that the Japanese giving and receiving verbs take non-tensed complements. Since in the previous studies we found that the tensed verb acts as a crucial cue for the identification of the clause, we must clarify, for the next stage of inquiry, the mechanisms for comprehension of complex sentences without tensed verb. We must investigate these constructions in order to answer the following questions. Are there any difference between these complement constructions and the simple sentences? If there are, can the comprehension of these complement constructions be accounted for by the same mechanisms assumed in the comprehension of relative clauses? The second reason is that the Japanese giving and receiving verbs appear both as the main verb of complement construction and as the main verb of a simple sentence. Thus it is convenient to contrast the two uses of these verbs, in complement constructions and in simple sentence constructions. The third reason is that they can take noun phrases and complement verbs which are easy to act out, and thus are easy to devise an experiment on.

2. Grammatical characteristics of the Japanese giving and receiving verbs

There are several giving and receiving verbs in Japanese. We chose the following three -- ageru, kureru (to give), and morau (to receive). Simple sentences with these verbs are illustrated below:

(1) a.   Taroo ga   Hanako ni   ame o   ageta.
       Taroo(Subj.)   to Hanako   candies(Obj.)   gave

     b.   Taroo ga   otooto ni   ame o   kureta.
                   to (my) brother   gave.

     c.   Taroo ga   Hanako ni   ame o   moratta.
                   from Hanako   received.

Both ageru and morau translate as 'to give' in English but their grammatical property are quite different. If the indirect object (noun with the particle ni) is a person who belongs to the speaker's inner group (such as his/her brother, sister, friends, etc.) or who is in a closer relation the speaker relative to the subject, then we must use the verb kureru. If the speaker's relation to the indirect object is less close or that to the subject is closer than to the indirect object, then we use ageru. We will refer to the speaker's judgement on the relation to the person appearing as the subject, the indirect object, etc., as the speaker's point of view.

If we disregard the speaker's point of view, fundamental grammatical roles of noun phrases involved in the sentences with morau is very similar to the passive constructions in Japanese, especially to the so-called indirect passives illustrated below:
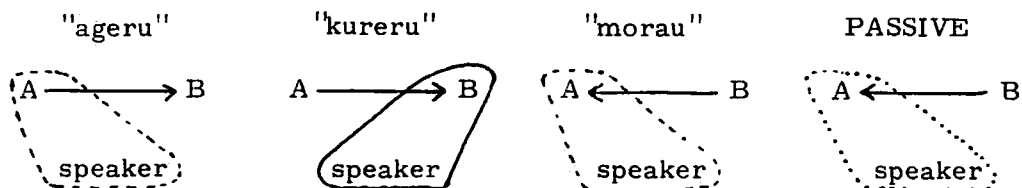
(2)   Taroo wa Hanako ni tegami o yomareta
                by a letter   was read

The following table shows which noun phrase bears which grammatical role to the verb.

	N-ga	N-ni	N-o
ageru	Agent/Source	Recepient/Goal	Object
kureru	Agent/Source	Recepient/Goal	Object
morau	Recepient/Goal	Agent/Source	Object
PASSIVE	Recepient	Agent	Object

Combining the above information with the speaker's point of view, we illustrate by means of the charts the meaning of the sentences with giving and receiving verbs. We add a chart for the passive sentence for contrast. In the charts, the letter A is the noun phrase with the particle ga and B is the noun phrase with the particle ni. An arrow indicates the direction of the movement of the object (or the direction of the action). The circle (solid or broken) indicates to which noun phrase (A or B) the speaker's point of view is directed. The solid or broken line indicates the degree of closeness of the speaker's point of view.
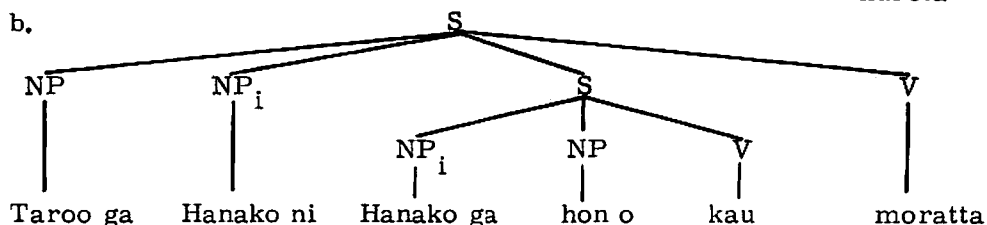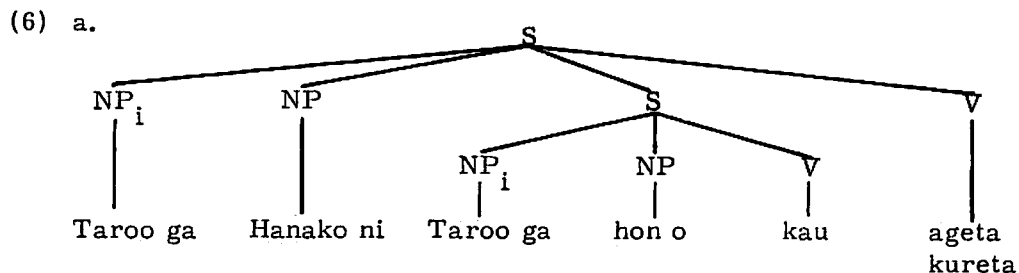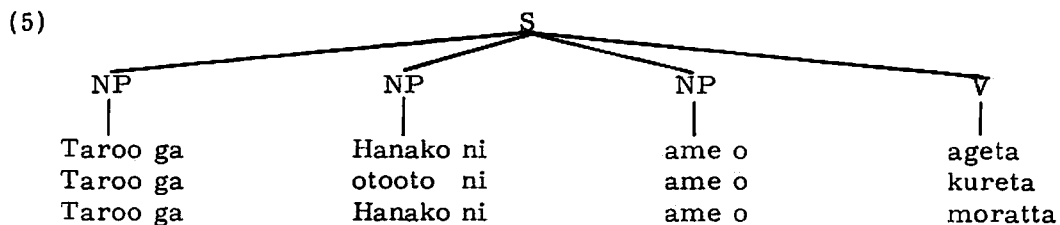
(3) CHART I

"ageru"　　　　　"kureru"　　　　　"morau"　　　　　PASSIVE

A ──────→ B　　A ──────→ B　　A ←────── B　　A ←┄┄┄┄ B

　speaker　　　　speaker　　　　　speaker　　　　　speaker

　　　　As noted before, the Japanese giving and receiving verbs can take sentence complements. The following are some typical examples:

(4) a. Taroo ga　Hanako ni　hon o katte　ageta
　　　　　　　　for Hanako　book　buy　gave

　　b. Taroo ga　otooto ni　　　　hon o　katte kureta
　　　　　　　　for (my) brother

　　c. Taroo ga　Hanako ni　　hon o katte　moratta
　　　　　　　　from Hanako

Concerning the speaker's point of view, we can find the same grammatical property as the one found in the simple sentences. That is, we can apply, without any modification, the charts in (3) not only for the simple sentences but also for the complex sentences in (4). Difference between simple and complex sentences is that in the simple sentences the object is expressed with a single noun phrase but in the complex sentences it is expressed by a proposition. Thus the underlying structures for the sentences in (1) would roughly be (5), and those for the sentences in (4) would be (6).

(5)

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                              S
        NP            NP            NP            V
        |             |             |             |
     Taroo ga      Hanako ni      ame o         ageta
     Taroo ga      otooto  ni     ame o         kureta
     Taroo ga      Hanako ni      ame o         moratta
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(6) a.

```
                              S
     NP_i         NP                 S                  V
      |            |          NP_i    NP    V           |
      |            |           |       |    |           |
   Taroo ga    Hanako ni    Taroo ga  hon o kau      ageta
                                                     kureta
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　b.

```
                              S
     NP          NP_i                S                  V
      |            |          NP_i    NP    V           |
      |            |           |       |    |           |
   Taroo ga    Hanako ni    Hanako ga hon o kau      moratta
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170

The sentences like (4a, b) are derived from the underlying structure (6a) by the deletion of NP <u>Taroo</u> in the constituent S under identity to the NP <u>Taroo</u> in the matrix sentence.

To avoid the difficulty of indicating the inner group in the stimulus sentences and at sometime judging whether or not the response is correct, we modify the sentences in order to neutralize the speaker's point of view. We also added <u>NP-ga NP-no NP-o ageru/kurere</u> (NP-no is the genitive noun phrase to NP-o, but the meaning is equivalent) because this sequence is more natural than the sequence <u>NP-ga NP-ni NP-o ageru/kureru</u>. Preliminary experiment ensured that these modifications bear no relevant distortion on the results.

3. Experiment I

<u>Subjects</u>: 66 native Japanese children from 3 to 6 years of age, all judged normal by their teachers. They had attended a kindergarten in Tokyo for one to three years and were divided into four experimental groups: (1) fourteen 3 year olds (6 boys and 8 girls), (2) nineteen 4 year olds (8 boys and 11 girls), (3) seventeen 5 year olds (9 boys and 8 girls), (4) sixteen 6 year olds (11 boys and 5 girls).

<u>Test-items</u>: 3 types of simple sentences with giving and receiving verbs (<u>ageru</u> (give), <u>kureru</u> (give), <u>morau</u> (receive)) and 5 types of complex sentences. The following example sentences were used:

   1. AS (Ageru-Simple)

      kitune ga usagi ni ame o ageru
      fox   rabbit   candy give
      The fox gives a candy to the rabbit.

   2. KS (Kureru-Simple)

      neko ga tanuki ni enpitu o kureru
      cat   racoon   pencil   give
      The cat gives a pencil to the racoon.

   3. MS (Morau-Simple)

      zoo ga   inu ni ringo o morau
      elephant dog   apple   receive
      The elephant receives an apple from the dog.

   4. ACni (Ageru-Complex ni)

      usagi ga zoo ni   kata o   tataite ageru
      rabbit   elephant shoulder tap   give
      The rabbit taps the shoulder for the elephant.

   5. ACno (Ageru-Complex no)

      usagi ga zoo no   kata o   tataite ageru
      rabbit   elephant shoulder tap   give
      The rabbit taps the shoulder of the elephant.

171

6. KCni (Kureru-Complex ni)

   neko ga kitune ni senaka o kaite   ageru
   cat   fox   back   scratch give
   The cat scratches the back for the fox.

7. KCno (Kureru-Complex no)

   neko ga kitune no senaka o kaite   kureru
   cat   fox   back   scratch give
   The cat scratches the back of the fox.

8. MC (morau-Comples)

   inu ga tanuki ni atama o nadete morau
   dog   raccoon   head   pat   receive
   The dog had its head patted by the raccoon.

Six animal names used in the sentences are inu (dog), neko (cat), tanuki (raccoon), kitune (fox), usagi (rabbit), zoo (elephant). Three object names used in the simple sentences are ame (candy), enpitu (pencil), and ringo (apple). Three body-part names used in the complex sentences are atama (head), kata (shoulder), and senaka (back). Three verbs used in the complex sentences are tataku (tap), kaku (scratch), and naderu (pat).

Procedure: A sentence-picture matching test was used for checking the subject's comprehension of the sentences. One set of pictures contains four different drawings (see the samples). Twenty-four sets of pictures were prepared for matching each stimulus sentence.
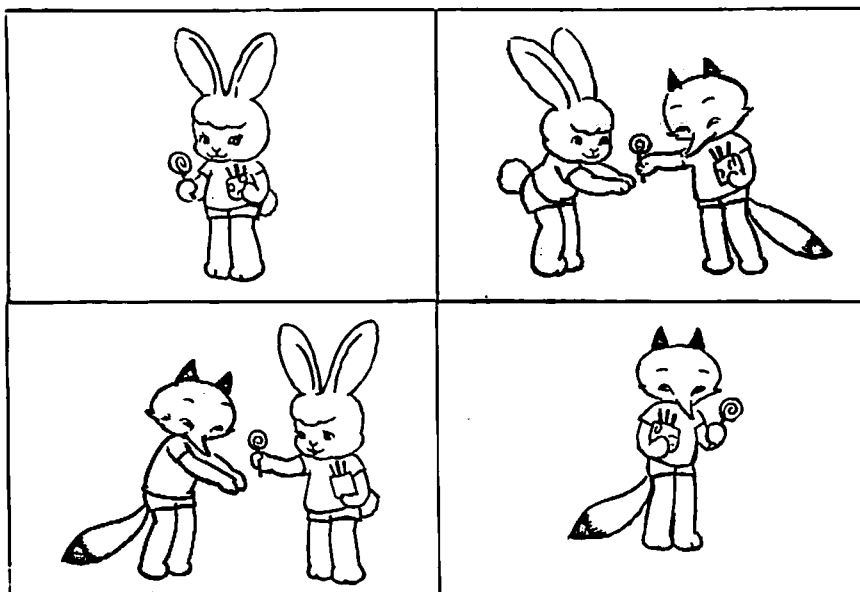
Picture Card Set 1 (Match for Sentence 1 in Example)

172
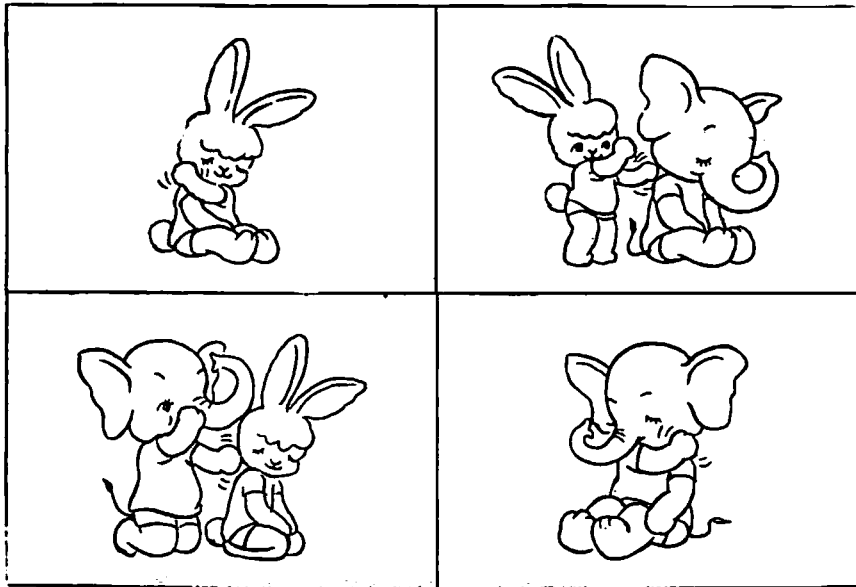
Picture Card Set 2 (Match for Sentence 4 and 5 in Example)

Each subject was interviewed individually. Before the test-items were given, the experimenter asked the subject to name the drawings of animals to be used in the experimental session in order to confirm that the subject was able to identify the animals correctly. Then the experimenter presented a tape recorded test-sentence twice showing the set of pictures and had the subject point out the appropriate drawing. Test-items were presented one at a time in the order listed below to half of the subjects and in the reverse order to the other half. (See Appendix I)

Results: Figure 1 - 4 show the percentages of correct responses against total stimuli. As expected, there was a tendency for the percentage of correct responses to increase gradually with age for all types of stimuli. (Note that in the complex sentences --ga --ni --o verb constructions and --ga --no --o verb constructions were treated as identical, because their percentages of correct responses showed no significant differences).

Figure 1 and 2 show remarkable differences between the sentences containing ageru, kureru (A, K) and the sentences containing morau (M). Generally speaking, AS, KS, AC and KC are much higher than MS and MC, which came out lower than 50% level at the age of 5.

There is a close resemblance between Figure 1 (simple sentences) and Figure 2 (complex sentences). Figure 3 shows that there is no significant difference in the mean correct responses between simple and complex sentences. This indicates that the acquisition of simple and complex sentences with giving and receiving verbs progresses simultaneously or children are sensitive to the very same factors when they come to understand giving and receiving sentences. Therefore, we can treat simple and complex sentences as belonging to the same class. Figure 4 shows mean correct responses of Ageru, Kureru and Morau sentences.
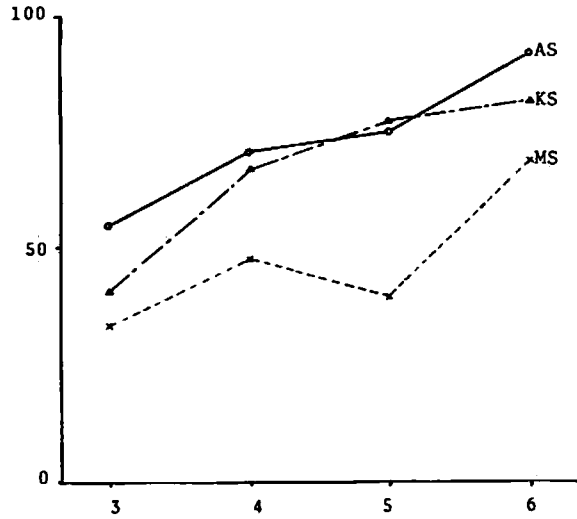
Fig. 1. Percentages of correct responses for
simple sentences with ageru (AS), kureru (KS),
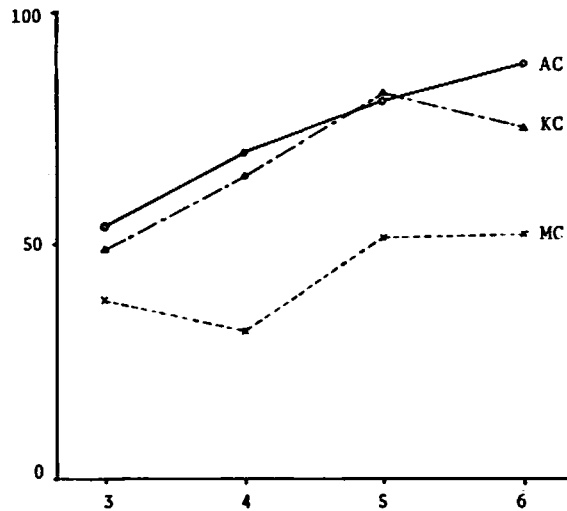and morau (MS).

Fig. 2. Percentages of correct responses for
complex sentences with ageru (AC), kureru (KC),
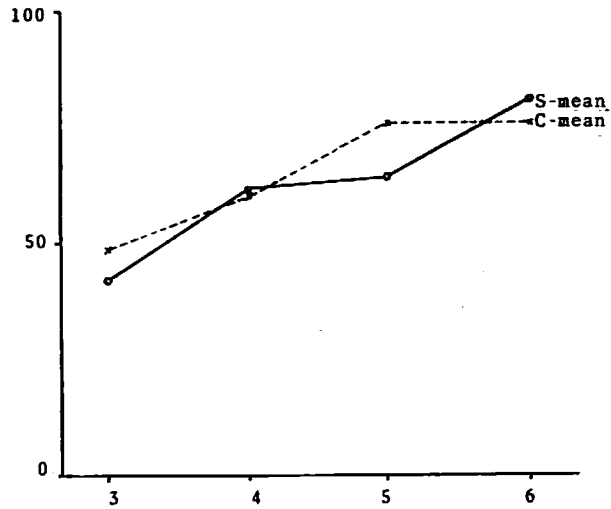and morau (MC)

Fig. 3. Percentages of correct responses for simple (S-mean) and complex (C-mean) sentences.
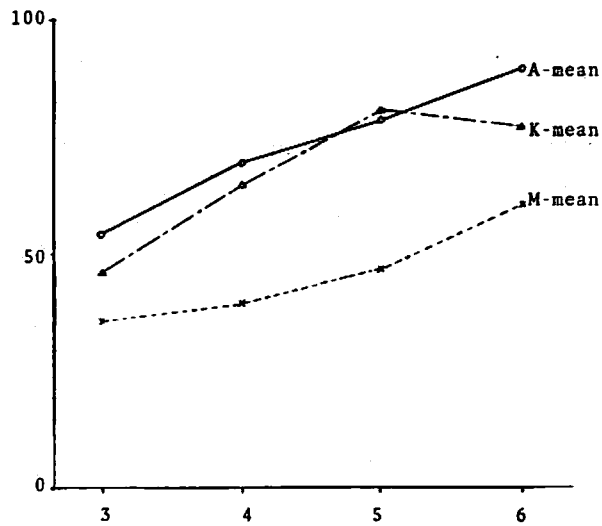

Fig. 4. Percentages of correct responses for the sentences with ageru (A-mean), kureru (K-mean), and morau (M-mean).

4. Experiment II

Subjects: 50 native Japanese children from 4 to 6 years of age. They were divided into 3 experimental groups: (1) thirteen 4 year olds (5 boys and 8 girls), (2) thirteen 5 year olds (8 boys and 5 girls), (3) twenty-four 6 year olds (7 boys and 17 girls).

Test-items: Same as Experiment I

Procedure: A so-called repetition task was used. Each subject was interviewed individually. The subject was presented a stimulus sentence only once and was required to repeat it immediately. All the responses were tape-recorded. Test-items were presented in the same order as was in ExperimentI to half the subjects and in the reverse order to the other half.
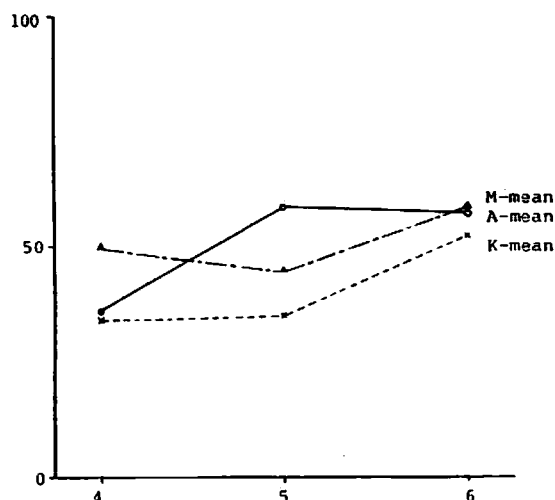

Fig. 5. Percentages of correct responses for the sentences with ageru, kureru and morau in the Experiment II.
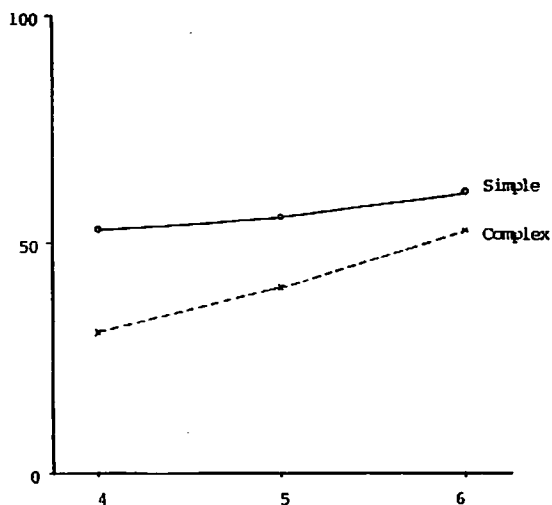

Fig. 6. Percentages of correct responses for simple and comples sentences in the Experiment II.

Results: Figure 5 and 6 show the percentage of correct responses against total stimuli for A, K, M sentences (Fig. 5) and for simple and complex sentences (Fig. 6). Figure 6 shows that the correct responses for the complex sentences were remarkably less than the simple sentences. Figure 5, however, does not show a significant difference among the three types of sentences.

A typical tendency of mistakes can be seen, if we focus our attention to the verbs ageru, kureru and morau at the end of the sentences. Tables 1 - 6 show the confusion matrices of ageru (A), kureru (K) and morau (M). 'A,' 'K' and 'M' in the leftmost column stand for the stimulus sentences containing ageru, kureru and morau, respectively. 'A,' 'K' and 'M' at the uppermost row stand for the responses so that each entry expresses the percentage of confused responses. 'Others' include the confusion of ageru to yaru (impolite form of ageru) or no response, and so on. The percentages of correct responses are omitted from the table (hyphens).

176

Tables 1-6. Confusion matrices of the verbs <u>ageru</u> <u>kureru,</u> and <u>morau.</u>

Table 1. 4 year olds Simple

S\R	A	K	M	Othrs.	T
A	—	2	1	0	3
K	9	—	1	1	11
M	2	1	—	1	4
T	11	3	2	2	18

Table 2. 4 year olds Complex

S\R	A	K	M	Othrs.	T
A	—	11	1	3	15
K	8	—	1	1	10
M	2	3	—	3	8
T	10	14	2	7	33

Table 3. 5 year olds Simple

S\R	A	K	M	Othrs	T
A	—	0	0	2	2
K	15	—	2	0	17
M	6	0	—	0	6
T	21	0	2	2	25

Table 4. 5 year olds Complex

S\R	A	K	M	Othrs.	T
A	—	5	2	3	10
K	15	—	4	3	22
M	5	1	—	1	7
T	20	6	6	7	39

Table 5. 6 year olds Simple

S\R	A	K	M	Othrs	T
A	—	0	1	3	4
K	9	—	1	2	12
M	3	1	—	2	6
T	12	1	2	7	22

Table 6. 6 year olds Complex

S\R	A	K	M	Othrs.	T
A	—	5	0	3	8
K	12	—	1	2	15
M	2	2	—	0	4
T	14	7	1	5	27

We can make some very interesting observations from the chart. First, there is no difference along age, but all the age groups show the same tendency, i.e., they confused <u>ageru</u> and <u>kureru</u> - especially <u>kureru</u> for <u>ageru</u> (8% - 15%) - while they seldom confused 'ageru, <u>kureru</u>' with 'morau' (0% - 6%). We also observe a remarkable difference of confusions between simple and complex sentences, i.e., there are much more confusions in the complex than in the simple sentences.

5. Experiment III

Subjects: 45 native Japanese children. (1) fifteen 4 year olds (7 boys and 8 girls), (2) fifteen 5 year olds (8 boys and 7 girls), (3) fifteen 6 year olds (6 boys and 9 girls).

Test-items: Simple and complex sentences with the verbs ageru, kureru and morau, three sentences each, and three passive sentences, totaling 21 sentences, were used for the stimuli. The aminal names used in the sentences are usagi (rabbit), uma (horse), kuma (bear), sika (deer), kirin (giraffe), and zoo (elephant). The object names used are ame (candy), banana (banana), and enpitu (pencil) in the simple sentences, and atama (head), kata (shoulder), senaka (back), and onaka (belly) in the complex sentences. The verbs of the complement clauses are tataku (tap), kaku (scratch), naderu (pat), osu (push), and keru (kick). (See the Appendix II)

Procedure: An act-out method was used. Before the test-items were given, the experimenter asked the subject to name the toys to be used in the experimental session in order to confirm that the subject was able to identify the toys correctly. Then the experimenter put two animal toys and an object (e. g., candy), and presented a tape-recorded stimulus sentence twice to make the subject act-out. In each session, at least two observers (including the experimenter) recorded the subject's performance. As in Experiment I test-items were presented in the order listed below to half of the subjects and in the reverse order to the other half.

Results: Figure 7-10 show the percentage of correct responses against total stimuli. The percentage of correct responses to M are much lower than those of A and K, in both simple and complex sentences (Fig. 7, 8). There is little difference between A and K. Figure 7 and Figure 8 again show the close resemblance between simple and complex sentences. This result strongly supports the assumption that the children are sensitive to the very same factors when they come to understand simple and complex
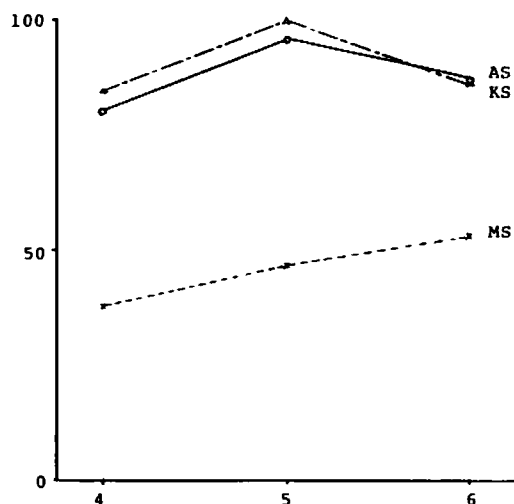

Fig. 7. Percentages of correct responses for the simple sentences with ageru, kureru, and morau in the Experiment III.
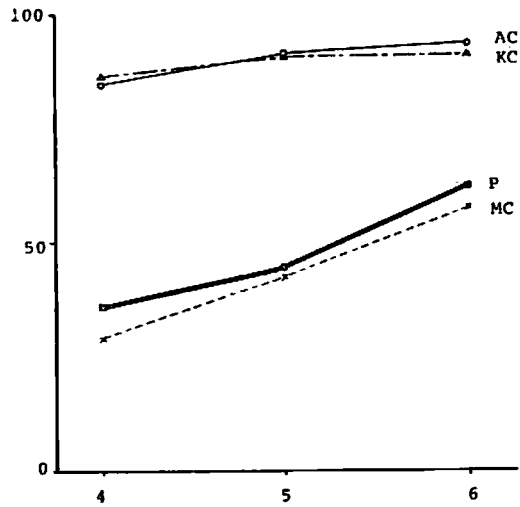
Fig. 8. Percentages of correct responses for the
complex sentences with <u>ageru</u>, <u>kureru</u>, and
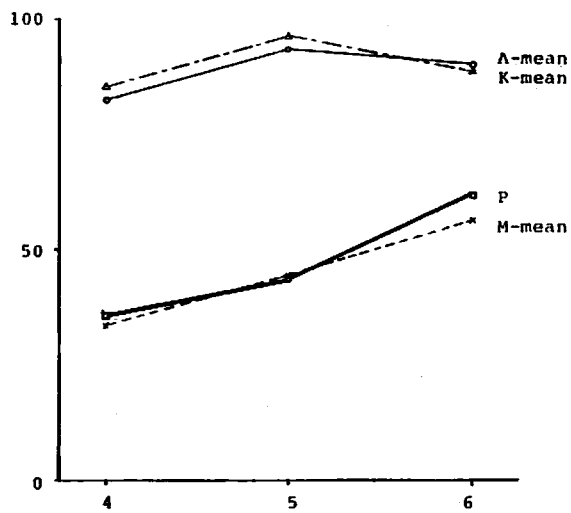<u>morau</u> in the Experiment III.

Fig. 9. Percentages of correct responses for the
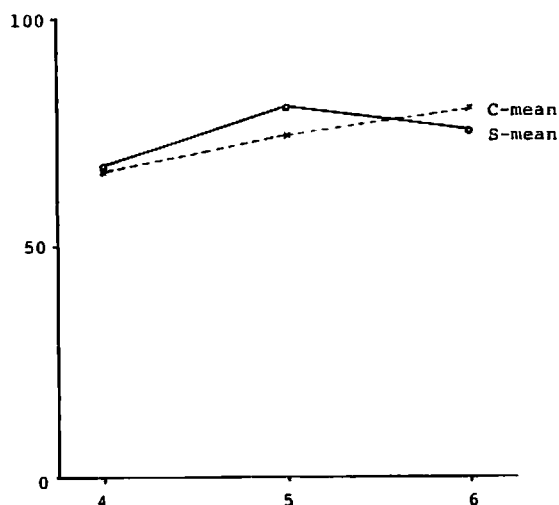sentences with <u>ageru</u>, <u>kureru</u>, and <u>morau</u>.

Fig. 10. Percentages of correct responses for the
simple and complex sentences.

sentences with giving and receiving verbs. No significant difference be-
tween the average correct responses of simple sentences and those of com-
plex sentences is observed in Figure 10.

The percentages of correct responses to passive sentences (P) are
almost the same as those for M (Fig. 9).

As for A, K, M sentences, the general tendency of correct responses
is almost the same as those of Experiment I except that the absolute level
of A and K in Experiment III is slightly higher than in Experiment I. This
difference might be due to the difference of experimental procedures.

6. Discussion

To summarize the above observations made so far:

i) Sentences with ageru and kureru are acquired earlier than the sen-
tences with morau (in experiments I and III).

ii) In experiment II, no clear difference could be observed in the cor-
rect response to the sentences with ageru, kureru, and morau. This con-
trasts with the results of experiments I and III.

Focusing exclusively on the verbs, we observe that the verb kureru is
often misunderstood as ageru. On the contrary, the percentage of mis-
understanding of morau as ageru or kureru is very low.

iii) There is no meaningful difference in the percentages of correct
responses for simple and complex sentences, in Experiment I and III.

iv) In Experiment II, we observe quite a difference in the percentages
of correct response between the simple and complex sentences with every
verb.

v) In Experiment III, the correct response percentage for the passive
is nearly the same as those of the sentence with morau, thus it is much
lower than that of ageru and kureru.

In the sentences with <u>ageru</u> or <u>kureru</u>, the noun phrase with the particle <u>ga</u> (hereafter ga-NP) takes the role of Agent/Source, and in the sentences with <u>morau</u>, ga-NP takes the role of Recepient/Goal. The latter is also true for the passive sentences used in the Experiment III. This difference seems to play a vital role in determining the time difference of acquisition of these constructions. That is, the construction in which the ga-NP bears the Agent/Source is acquired at an earlier stage than those in which the ga-NP bears the Recepient/Goal role. From the point of view of perceptual strategy, this fact can be accounted for by assuming that the strategy that converts ga-NP into Agent/Source is formed in the earlier stages.

Furthermore, observation in ii) shows that <u>ageru/kureru</u> is distinguished from <u>morau</u>, and thus it is clear that the direction of the movement of the object are understood by children of these ages. Perhaps, the strategy noted above is over-extended in use and interferes in the development of the understanding of the sentences with <u>morau</u>.

As noted in the second section, the difference between <u>ageru</u> and <u>kureru</u> exists only in the assignment of the speaker's point of view. This would account for the difference noted in ii).

The notion of the speaker's point of view is, in a narrower sense, different from the information involved in the semantic representation, which gives the propositional content of the sentence. Thus, it is impossible to treat it as perceptual strategy as is assumed here. Our strategy uses only the syntactic information appearing in the surface sentence, but the speaker's point of view is not overtly indicated by a sign.

From iii), it is apparent that Agent/Source role played by ga-NP is a more important factor in determining the fundamental semantic relations of NPs in the sentence than the difference between simple and complex information. This can also offer a unified explanation for the results observed in the passive construction.

As shown in iv), Experiment II demonstrates the difference in correct responses to simple and complex sentences. One of the reasons could be that the difference in memory load affects the comprehension of these sentences, not the constructional difference of simple and complex sentences. It is necessary to conduct an experiment in which the length of the sentence is controlled. It is dangerous to speculate, at this stage of investigation, that the observation iv) is brought about by a structural difference between simple and complex sentences.

Appendix

The Test-Sentences Used

I. Experiment I and II

1. (AS)　　kitune ga usagi ni ame o　ageru
　　　　　　fox　　　rabbit　candy　give
　　　　　　'The fox gives a candy to the rabbit.'
2. (MS)　　tanuki ga　neko ni　enpitu o　morau
　　　　　　raccoon　cat　　pencil　receive
　　　　　　'The raccoon receives a pencil from the cat.'
3. (KC-ni)　inu ga tanuki ni atama o nadete　kureru
　　　　　　dog　raccoon　head　　pat　　give
　　　　　　'The dog pats the head for the raccoon.'
4. (AC-no)　kitune ga　neko no　senaka o　kaite ageru
　　　　　　fox　　　cat　　back　　scratch give
　　　　　　'The fox scratches the back of the cat.'
5. (MC)　　inu ga　tanuki ni　atama o　nadete morau
　　　　　　dog　　raccoon　head　　pat　　receive
　　　　　　'The dog had its head patted by the raccoon.'
6. (AS)　　tanuki ga　neko ni　enpitu o　ageru
　　　　　　raccoon　cat　　pencil　give
　　　　　　'The raccoon gives a pencil to the cat.'
7. (KC-ni)　zoo ga　usagi ni　kata o　tataite kureru
　　　　　　elephant rabbit　shoulder tap　　give
　　　　　　'The elephant taps the shoulder for the rabbit.'
8. (MS)　.kitune ga　usagi ni　ame o　morau
　　　　　　fox　　　rabbit　candy　receive
　　　　　　'The fox receives a candy from the rabbit.'
9. (KC-no)　tanuki ga　inu no　atama o　nadete kureru
　　　　　　raccoon　dog　　head　　pat　　give
　　　　　　'The raccoon pats the head of the dog.'
10. (MS)　　zoo ga　inu ni　ringo o　morau
　　　　　　elephant dog　apple　receive
　　　　　　'The elephant receives an apple from the dog.'
11. (KC-ni)　kitune ga　neko ni　senaka o　kaite　kureru
　　　　　　fox　　　cat　　back　　scratch give
　　　　　　'The fox scratches the back for the cat.'
12. (MC)　　usagi ga　zoo ni　kata o　tataite morau
　　　　　　rabbit　　elephant shoulder tap　　receive
　　　　　　'The rabbit had its shoulder tapped by the elephant.'
13. (AC-no)　inu ga　tanuki no　atama o　nadete ageru
　　　　　　dog　　raccoon　head　　pat　　give
　　　　　　'The dog pats the head of the raccoon.'
14. (KS)　　usagi ga　kitune ni　ame o　kureru
　　　　　　rabbit　　fox　　　candy　give
　　　　　　'The rabbit gives a candy to the fox.'
15. (AC-no)　zoo ga　usagi no　kata o　tataite ageru
　　　　　　elephant rabbit　shoulder tap　　give
　　　　　　'The elephant taps the shoulder of the rabbit.'

182

16. (KC-no) neko ga kitune no senaka o kaite kureru
            cat   fox   back   scratch give
            'The cat scratches the back of the fox. '
17. (AC-ni) usagi ga zoo ni kata o tataite ageru
            rabbit   elephant shoulder tap   give
            'The rabbit taps the shoulder for the elephant. '
18. (KS)   inu ga zoo ni ringo o kureru
            dog   elephant apple   give
            'The dog gives an apple to the elephant. '
19. (MC)   neko ga kitune ni senaka o kaite morau
            cat   fox   back   scratch receive
            'The cat had its back scratched by the fox. '
20. (AS)   zoo ga inu ni ringo o ageru
            elephant dog   apple   give
            'The elephant gives an apple to the dog. '
21. (KC-no) usagi ga zoo no kata o tataite kureru
            rabbit   elephant shoulder tap   give
            'The rabbit taps the shoulder of the elephant. '
22. (AC-ni) neko ga kitune ni senaka o kaite ageru
            cat   fox   back   scratch give
            'The cat scratches the back for the fox. '
23. (KS)   neko ga tanuki ni enpitu o kureru
            cat   raccoon   pencil   give
            'The cat gives a pencil to the raccoon. '
24. (AC-ni) tanuki ga inu ni atama o nadete ageru
            raccoon   dog   head   pat   give
            'The raccoon pats the head for the dog.'

II. Experiment III.

 1. (AS)   uma ga usagi ni ame o ageru
            horse   rabbit   candy   give
            'The horse gives a candy to the rabbit.'
 2. (KS)   zoo ga kirin ni enpitu o kureru
            elephant giraffe   pencil   give
            'The elephant gives a pencil to the giraffe. '
 3. (MC)   kuma ga sika ni atama o nadete morau
            bear   deer   head   pat   receive
            'The bear had its head patted by the deer.'
 4. (KC)   usagi ga kuma no senaka o kaite kureru
            rabbit   bear   back   scratch give
            'The rabbit scratches the back of the bear. '
 5. (AC)   zoo ga usagi no kata o tataite ageru
            elephant rabbit   shoulder tap   give
            'The elephant taps the shoulder of the rabbit. '
 6. (MS)   sika ga kirin ni banana o morau
            deer   giraffe   banana   receive
            'The deer receives a banana from the giraffe. '
 7. (P)   kirin ga sika ni atama o tatakareru
            giraffe   deer   head   tap
            'The giraffe was tapped on the head by the deer. '

8. (AS)   kuma ga usagi ni enpitu o ageru
          bear   rabbit   pencil   give
          'The bear gives a pencil to the rabbit. '

9. (P)   kuma ga zoo ni onaka o kerareru
          bear   elephant belly   kick
          'The bear was kicked on the belly by the elephant. '

10. (MC)   sika ga uma ni kata o tataite morau
          deer   horse   shoulder tap   receive
          'The deer had its shoulder tapped by the horse. '

11. (KS)   usagi ga sika ni banana o kureru
          rabbit   deer   banana   give
          'The rabbit gives a banana to the deer. '

12. (AC)   usagi ga kuma no senaka o kaite ageru
          rabbit   bear   back   scratch give
          'The rabbit scratches the back of the bear. '

13. (MS)   kirin ga zoo ni ame o morau
          giraffe   elephant candy receive
          'The giraffe receives a candy from the elephant. '

14. (KC)   uma ga kirin no kata o tataite kureru
          horse   giraffe   shoulder tap   give
          'The horse taps the shoulder of the giraffe. '

15. (AC)   sika ga usagi no atama o nadete ageru
          deer   rabbit   head   pat   give
          'The deer pats the head of the rabbit. '

16. (KS)   usagi ga zoo ni ame o kureru
          rabbit   elephant candy give
          'The rabbit gives a candy to the elephant. '

17. (MC)   zoo ga sika ni senaka o kaite morau
          elephant deer   back   scratch receive
          'The elephant had its back scratched by the deer. '

18. (KC)   uma ga kuma no atama o nadete kureru
          horse   bear   head   pat   give
          'The horse pats the head of the bear. '

19. (MS)   zoo ga kirin ni enpitu o morau
          elephant giraffe pencil   receive
          'The elephant receives a pencil from the giraffe. '

20. (P)   uma ga usagi ni senaka o osareru
          horse   rabbit   back   push
          'The horse was pushed on the back by the rabbit. '

21. (AS)   uma ga kuma ni banana o ageru
          horse   bear   banana   give
          'The horse gives a banana to the bear. '

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