

《研究ノート》

**Japanese speakers' judgments of grammaticality of  
Japanese and English bitransitive sentences  
with a differing number of arguments :  
A comparison between speakers exposed to  
Chomsky's generative grammar and those not**

Hiroshi Nagata<sup>1</sup>

Bitransitive sentences are often characterized as comprising three arguments, an argument playing a thematic role of Agent, an argument playing a role of Theme, and an argument in the role of Recipient or Goal (e.g., Goldberg, 1995 ; Grimshaw, 1990 ; Wechsler, 1995). Many studies have accepted this characterization as being indubitable without addressing the problem of optionality of arguments. Thus, they are not concerned with whether or not a particular argument must appear in a bitransitive sentence for the sentence to be regarded as grammatical. Actually, few studies have explored this problem with the aim of relating it to the actual state of language knowledge possessed by native speakers of a language. This study investigates the linguistic intuition which native speakers of Japanese exhibit when they judge the grammaticality<sup>2</sup> of bitransitive sentences with a differing number of arguments.

Nagata and Bain (2000) have shown that Japanese speakers judge Japanese bitransitive sentences to be highly grammatical irrespective of the number of arguments involved in them. In contrast, English speakers give differentiated judgments to English bitransitive sentences, rating such sentences including all three arguments as being most grammatical and other sentences lacking one or two arguments as being less grammatical. The pattern of judgments in English speakers is mainly consistent with a general description of bitransitive sentences offered by linguists (e.g., Chomsky, 1981 ; Bresnan & Kaplan, 1982 ; Dik, 1991). However, Japanese speakers showed a strong tendency to accept sentences lacking one or two arguments as being grammatical. Nagata (2001) also found they judged sentences even consisting of only a verb with an average score of 4 or more on a 7-point rating scale. Since the sentences used were isolated simple sentences, such findings are not consistent with linguists' descriptions which require that arguments must be present for bitransitive sentences to be grammatical (Tsuji-mura, 1996 ; Hasegawa, 1999) or that a certain constraint be required if the arguments do not

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1 The author is heavily indebted to Professor Akira Baba, Tokyo University of Foreign Studies, for administering the judgment tests to his students and for offering the author valuable comments.

2 Despite the Newmeyer (1983) argument, we have adopted "grammaticality" instead of "acceptability" judgments for the same reason as mentioned previously (Nagata, 1988). See also Christiansen and Chater (1999) for an argument in support of our position.

appear in the bitransitive sentences (Inoue, Harada & Abe, 1999 ; Hasegawa, 1999).

The difference in judged grammaticality between the two languages may be captured with Huang's distinction (1984) between English as a sentence-oriented language and Japanese as a discourse-oriented language.<sup>3</sup> In the former type of language the information required to understand a sentence is involved in the sentence itself, while in the latter type of language it can be enriched by other variables including extrasentential information and knowledge of the world. Thus a verb in the sentence-oriented language strongly requires its argument(s) compared to a verb in the discourse-oriented language. In this regard, each argument is linked with the verb more tightly in English bitransitive sentences than in the Japanese ones. Hence English speakers may reject sentences lacking one or more arguments as ungrammatical, whereas Japanese speakers may accept them as grammatical.

This study explores the effect of exposure to Chomsky's generative grammar (hereafter called generative grammar) on the judgments of grammaticality of Japanese and English bitransitive sentences in native speakers of Japanese. Chomsky's generative grammar emphasizes a formal analysis of the syntactic structure of isolated sets of sentences in terms of whether they are being derived fully consistently with one or other specified principles or conditions. This emphasis is expected to direct speakers' attention particularly to the syntactic aspects of the sentences, with little reliance on extrasentential information. This attention to syntax would be expected to facilitate speakers of Japanese in adopting a sentence-oriented strategy.

In this study, we test two groups of speakers of Japanese, one group consisting of speakers who have been exposed to generative grammar and the other consisting of those who have not. The groups judge the grammaticality of bitransitive sentences with a differing number of arguments twice: once for Japanese sentences and once for English sentences. Two hypotheses are tested. (1) No difference in judged grammaticality will be found for the English sentences, and, the pattern of judgments in the two groups of Japanese speakers will approximate that of judgments provided by native speakers of English. This is because the two groups of Japanese speakers have been learning English for six years or more and because they are individuals who have an ability of English sufficient to enter into a university of high standard in Japan. Effect of exposure to generative grammar will be negligible, because it seems that these speakers, irrespective of the experience of generative grammar, already know the syntactic structure itself as a primary cue for the grammaticality of English sentences. (2) The effect of exposure will appear in the judgments of Japanese sentences to be such that the speakers exposed to generative grammar judge the sentences lacking one or two arguments to be less grammatical than sentences with all required arguments present. This is so because they have developed, through the experience of generative grammar, a cognitive strategy to judge the sentences in their own right, independently of extrasentential pragmatic information.

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3 Note that these two terms are, according to Huang (1984), due to the Tsao (1977) dissertation.

## Method

### *Stimulus Sentences*

The stimulus sentences, Japanese and English, were the same ones as those used in a previous study (Nagata & Bain, 2000).

*Japanese Sentences.* There were two sets of stimulus items, target and nontarget. Target items consisted of 15 sentences and included the following verbs : *ataeta* (gave), *motometa* (asked), *watashita* (handed), *kubatta* (distributed), *kaeshita* (returned), *teikyoushita* (provided), *okutta* (presented), *yuzutta* (transferred), *kashita* (rented), *utta* (sold), *miseta* (showed), *todoketa* (sent), *azuketa* (left), *sasageta* (offered), and *hodokoshita* (bestowed). These verbs (Vs) may each co-occur with the three arguments, i.e., subject (S), direct object (O) and indirect object (D), according to a distributional analysis (Ikehara, Miyazaki, Shirai, Yokoo, Nakaiwa, Ogura, Oyama, & Hayashi, 1997). Nontarget items consisted of two sets of 10 sentences, with one set being grammatical and the other set ungrammatical. The nontargets came from among those appearing in Kuno (1973, 1983) and Nagata (1990).

The target items were constructed such that these verbs were combined with one, two or three arguments. Seven types of target sentences were thus constructed : three types of items involving one argument (SV, DV and OV), three types of items involving two arguments (SDV, SOV, and DOV), and one type of item involving all three arguments (SDOV). (Note that in Japanese a verb occurs last in a simple sentence.) A nominative postpositional marker, *ga*, was attached to the words serving as S ; a dative marker, *ni*, was attached to those serving as D ; and an accusative marker, *o*, was attached to those serving as O.

*English Sentences.* Target items included one of the following 15 verbs : *gave*, *asked*, *handed*, *distributed*, *returned*, *provided*, *presented*, *demanded*, *rented*, *sold*, *showed*, *sent*, *granted*, *offered* and *delivered*. Seven types of sentences were SV, VD, VO, SVD, SVO, VOD and SVOD, where the position of the verb was conformed to the basic word order of English. Twenty nontarget items, 10 grammatical and 10 ungrammatical, were drawn from among those which appeared in Radford (1981).

See Nagata and Bain (2000) for Japanese and English sample target sentences.

### *Participants*

There were 58 participants, 30 participants who had joined the course<sup>4</sup> of generative grammar and 28 who had not. Those who had experienced generative grammar, 14 men and 16 women, were students or graduate students from Tokyo University of Foreign Studies (n = 18), Hosei University (n = 6), University of the Sacred Heart (n = 4), and Meiji University (n = 2). They ranged in age from 20 to 38 years, with the mean age of 24.5 years.

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4 The participants were exposed to generative grammar through one of the following textbooks : Radford, A. (1997) *Syntax : A minimalist introduction*. Cambridge University Press ; Lasnik, H. (1999) *Minimalist analysis*. Blackwell ; Roberts, I. (1997) *Comparative syntax*. Arnold ; Mihara, K. (1998) *Seiseibunpoo to hikaku toogoron* (Generative grammar and comparative syntax). Kuroshio Shuppan.

Forty-one of these participants (70.1%) were majoring in English. The participants who had not experienced the course were those who had just entered Tokyo University of Foreign Studies, 6 men and 22 women. They were all students majoring in English, ranging in age from 18 to 22 years with the mean age of 18.4 years.

### *Design*

A  $2 \times 7$  factorial design included Experience of generative grammar (GG-experienced, GG-inexperienced) and Type of sentences which corresponded to the seven types of sentences.

### *Procedure*

All participants were tested twice, once for Japanese sentences and once for English sentences, with a testing interval of a week or more. They were tested on the Japanese sentences first and then on the English sentences. The testing procedure was the same for the two languages.

Stimulus items were given in a booklet form. Three types of booklets were prepared, each consisting of four pages. The first page gave instructions necessary for the participants to complete the booklet. The second through fourth pages were used for the sentences that contained one, two and three arguments, respectively. The number of arguments was increased across the pages to exclude the possibility that the target sentences involving the greater number of arguments would influence the judged grammaticality of those involving the smaller number of them.

The 15 verbs were divided into three sets of five to make three different versions of the pages on which sentences involving one or two arguments were presented. The three sets of five verbs and three versions of booklet were combined such that the fifteen different verbs would appear once on each page. For example, for the sentences which included one argument the first version of the booklet contained one set of five verbs occurring with a Subject word, while another set of five verbs occurring with a Dative word and still another set of five verbs occurring with an Object word. In the second and third version of booklet, which set of five verbs occurred with which argument was changed. This manipulation was made also for the three two-argument types. Much care was taken so that an equal number of participants received one of the three versions of the booklet.

The twenty nontargets, 10 grammatical and 10 ungrammatical sentences, were given mixed with the targets. Thus the second through fourth pages each included 35 testing items, 15 targets and 20 nontargets. The order of presentation of the 35 items was randomly determined. The 20 nontargets were given repeatedly on page 2 through 4.

Participants ranked the items for degree of grammatical correctness on a 7-point scale. They were instructed that grammatical sentences were those which were correct in Japanese or in English. They were to give a score of 7 to the sentences they judged as most grammatical but a score of 1 to those they judged as least grammatical. They were told to decide the degree of grammaticality—from 1 to 7—and to place the number that spontaneously came to mind inside the parentheses at the end of each sentence.

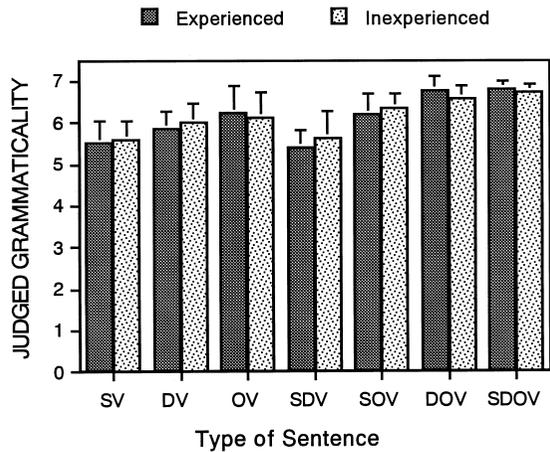


Fig. 1. Means and SDs of judged grammaticality (Japanese sentences)

The first page of the booklet instructed the participants on how to judge the grammaticality of sentences and on how to use the 7-point rating scale. For practice, the participants judged two sample sentences, one high in grammaticality and the other low. At the top of the second through fourth pages the rating scale was repeatedly shown. The participants were instructed to score each sentence in the order listed and not to skip any sentences.

## Results

*Japanese Sentences.* Judged grammaticality of the grammatical and ungrammatical nontargets was analyzed first. There were no significant differences due to Group (GG-experienced, GG-inexperienced), Version (version 1 through 3), or Repetition (1 st, 2 nd and 3 rd, corresponding to page 2, 3 and 4, respectively), nor interaction between each of them. The mean of the judged grammaticality of the grammatical and the ungrammatical nontargets was 6.72 (range : 6.48 – 6.86) and 1.45 (range : 1.31 – 1.65), respectively, for the GG-experienced participants, while it was 6.52 (range : 6.35 – 6.67) and 1.45 (range : 1.25 – 1.67) for the GG-inexperienced participants.

Fig. 1 shows the means of judged grammaticality for seven types of target sentences. A two-way analysis of variance showed no effect of Group, indicating that exposure to generative grammar had no influence on the judged grammaticality of the Japanese sentences. The effect of sentence type was significant,  $F_1(6, 133) = 17.65, p < .001$ ,  $F_2(6, 196) = 33.78, p < .001$ . Subsequent Tukey tests ( $p < .05$ , for both participants' and items' analyses) showed that the seven types of sentences could be classified approximately into three classes in terms of judged grammaticality for the GG-experienced speakers, while they could approximately be classified into two classes for the GG-inexperienced speakers. Specifically, for the GG-experienced speakers the first class of highest grammaticality comprised SDOV, DOV, SOV and OV, the second class of lowest grammaticality comprised two types of sentences, SV and SDV, and the third class of a single sentence type, the DV sentences, which fell between the first two classes. For the GG-inexperienced speakers, on the other hand,

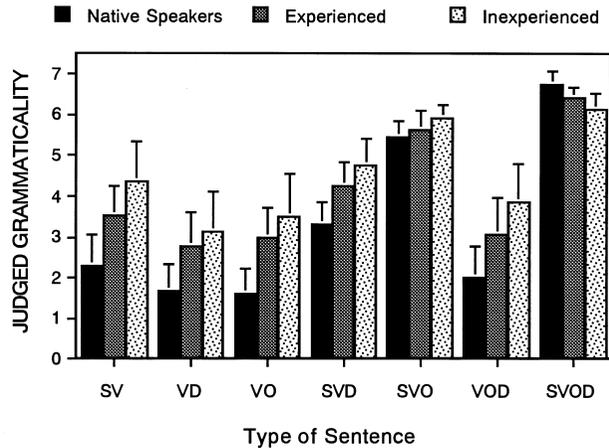


Fig. 2. Means and SDs of judged grammaticality (English sentences)  
Data for native speakers are from Nagata and Bain (2000)

one class consisting of two types of sentences, SV and SDV, was lower in judged grammaticality than the other class consisting of the remaining five types of sentences, DV, OV, SOV, DOV, and SDOV.

*English Sentences.* Again, neither the main effects nor the interactions between these variables were significant, except the main effect of Repetition for the ungrammatical nontargets,  $F_1(2, 104) = 9.50, p < .001$ ,  $F_2(2, 108) = 10.30, p < .001$  (3.23, 3.46, and 3.45 for Repetition 1, 2 and 3, respectively). The mean of the judged grammaticality of the grammatical and the ungrammatical nontargets was 6.08 (range: 5.76 – 6.38) and 3.32 (range: 2.95 – 3.60), respectively, for the GG–experienced speakers, and 5.92 (range: 5.69 – 6.09) and 3.44 (range: 2.93 – 3.88) for the GG–inexperienced speakers.

Fig. 2 shows the means of judged grammaticality for the seven types of sentences. It also shows the means we have obtained for native speakers of English (Nagata & Bain, 2000). Since the variances differed among the types of sentences, a single factor analysis of variance was performed separately for each type of sentences. Comparisons among the means were again done with Tukey test ( $p < .05$ ).

Judged grammaticality of the SV sentences differed among the groups,  $F_1(2, 32) = 17.84, p < .001$ ,  $F_2(2, 42) = 23.30, p < .001$ . Native speakers judged this type of sentences to be less grammatical than did the two groups of Japanese speakers. The GG–experienced speakers judged it lower than the GG–inexperienced speakers, but this was obtained only by an items–analysis. Similar findings were found also for the other two types of sentences, VO,  $F_1(2, 32) = 17.12, p < .001$ ,  $F_2(2, 42) = 66.70, p < .001$ , and VOD,  $F_1(2, 32) = 12.46, p < .001$ ,  $F_2(2, 42) = 62.80, p < .001$ . VD and SVD were the types of sentences native speakers judged less grammatical than the two groups of Japanese speakers, with no difference between the latter two groups [VD:  $F_1(2, 32) = 9.88, p < .001$ ,  $F_2(2, 42) = 31.60, p < .001$ ; SVD:  $F_1(2, 32) = 17.25, p < .001$ ,  $F_2(2, 42) = 5.70, p < .01$ ]. A marked difference was not found for a single sentence type, SVO, for which the score of the native speakers was lower than that of the GG–inexperienced speakers only by the participants’ analysis,  $F_1$

(2, 32) = 3.33,  $p < .05$ . In contrast, SVOD was a sentence type which the native speakers judged more grammatical than did Japanese speakers,  $F1(2, 32) = 12.47$ ,  $p < .001$ ,  $F2(2, 42) = 5.83$ ,  $p < .01$ .

## Discussion

Contrary to our expectation, Japanese speakers differed from native speakers of English in the judgments of English sentences. Specifically, they rated the five types of sentences (SV, VD, VO, SVD and VOD) more grammatical but the SVOD sentences less grammatical than the native speakers of English. The SVO was a single sentence type for which little, if any, difference was found between these two groups of speakers. However, the Japanese speakers showed a pattern of judgments for the seven types of sentences that was similar to that shown by the English speakers. Thus the seven types of sentences could be ordered in terms of judged grammaticality in almost the same way for both groups of speakers, Japanese and English.

The difference among the types of sentences was more marked in the English speakers than in the Japanese speakers. This finding indicates that the Japanese speakers accepted as grammatical even the English sentences without one or two arguments which the English speakers rejected as ungrammatical. The finding is to be noted when considering the Japanese speakers who participated in this study. They were students or graduate students not only majoring in English or those majoring in related fields but they also had so much interest in language as to join the course on generative grammar. Furthermore, they all came from universities of high standard in Japan. Hence the finding may indicate that even the present participants had not acquired—at least, as revealed by the judgment task used in this study—English to such a degree that they relied more heavily on the sentential properties of the sentences than on the extrasentential pragmatic information. This finding could be related to the earlier observations (Gass, 1987; Harrington, 1987; Kilborn & Ito, 1989; Sasaki, 1991) that when interpreting English sentences both Japanese speakers learning English and Italian speakers learning English maintain a lexical–semantic cue such as animacy instead of adopting a syntactic cue such as word order that is primarily used by English speakers. [Note here that in sentence interpretation both Japanese and Italian speakers, compared to English speakers, mostly use lexical–semantic cues (Bates, McNew, MacWhinney, Devescovi, & Smith, 1982; Gass, 1987, 1996)]. Furthermore, it is reported that a shift from a lexical–semantic interpretation strategy to a word–order interpretation strategy is more difficult than vice versa (Gass, 1987). Taken together, the present finding may suggest the difficulty Japanese speakers encounter when moving from a judgment strategy based on extrasentential information to that based on sentential information.

It must nonetheless be noted that the GG–experienced speakers approximated in judgment to the English speakers more closely than did the GG–inexperienced speakers. Although the GG–experienced speakers were more similar in judgments to the GG–inexperienced speakers than to the English speakers, the influence of exposure to generative grammar can be detected at least in this difference between the two groups of Japanese speakers. This difference between the two groups is similar to the difference observed by Kilborn and Ito (1989) for the two groups of Japanese speakers differing in proficiency in English. Thus advanced speakers of English in their study moved away from using the lexical–semantic strategy when interpreting English sentences and

tended to adopt instead the word–order strategy. Hence the difference between the two groups of Japanese speakers in this study could be attributed to whether or not they had been exposed to generative grammar.<sup>5</sup>

No difference in judgment was found between the two groups of Japanese speakers when they judged the Japanese sentences. The patterns of judgments were the same as those obtained in the previous studies (Nagata & Bain, 2000 ; Nagata, 2001). The grammaticality of each type of sentences was rated very high, except the two types, SV and SDV, which were rated slightly less grammatical than the remaining five types of sentences. No evidence was found for the experience of generative grammar. In this respect, we could say that the speakers of Japanese judge the Japanese sentences independently of the English sentences, applying primarily a discourse–oriented judgment strategy when judging the Japanese sentences. We had expected that exposure to generative grammar facilitates adopting a sentence–oriented judgment strategy, which then directed the GG–experienced speakers towards giving lower scores to the sentences lacking one or two arguments. No evidence for this expectation was confirmed, however. If participants had been given an extensive lecture which focussed on the argument structure involved in bitransitive sentences and on its syntactic realization, together with certain rules that link the two, a different pattern of judgments from that found in this study might appear. This possibility, however, remains to be explored.

In short, the present study, because of the nature of its design, cannot determine an exclusive effect of experience of generative grammar on the judgments of grammaticality of bitransitive sentences. Nonetheless it showed that the experience of generative grammar, together with other related experience, did influence Japanese speakers' judgments of grammaticality of English bitransitive sentences such that their judgments approximated to the pattern of judgments provided by English speakers. However, evidence for this experience was not found in their judgments of Japanese bitransitive sentences.

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5 The difference cannot be attributed exclusively to the factor of experience of generative grammar per se. This is because the design of this study cannot distinguish this factor from other unspecified experiences that might have occurred in an interval of three years or more from the entrance into university up to the point of the exposure to generative grammar. In this respect, we must say that GG–experienced speakers had experienced generative grammar plus other unspecified information related to English language which GG–inexperienced speakers had not. Confounding experiences of this sort could be ignored, however, given that even the GG–inexperienced speakers had undoubtedly acquired a very high–perhaps, approximating to the maximum–level of proficiency in interpreting bitransitive sentences used in this study. Bitransitive sentences involve the sentence structure that both groups of speakers learned when they were students of a junior high school. It seems unlikely that their proficiency would differ from the proficiency the GG–experienced speakers may have shown if these speakers had not been exposed to generative grammar.

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Hiroshi Nagata

This study investigates the judgments of grammaticality of Japanese and English bitransitive sentences with a differing number of arguments. Japanese speakers exposed to Chomsky's generative grammar ( $n = 30$ ) and those not exposed ( $n = 28$ ) were compared. This exposure was expected to facilitate a sentence-oriented judgment strategy that would direct speakers towards decreasing the grammaticality of the Japanese sentences lacking one or more arguments. Findings showed no effect in the judgments of Japanese sentences. However, in the judgments of the English sentences speakers exposed to generative grammar approximated to those made by native speakers of English. It was suggested that the exposure to generative grammar facilitated the sentence-oriented strategy in the judgments of English sentences, but it was not so effective as to weaken a discourse-oriented strategy used by Japanese speakers when they judged Japanese sentences.