THE ACQUISITION OF THE NARROW-RANGE RULES FOR THE DATIVE ALTERNATION IN ENGLISH BY JAPANESE AND CHINESE ADULT LEARNERS OF ENGLISH

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The purpose of this paper is to investigate whether adult Japanese and Chinese learners of English have access to the narrow-range rules for the dative alternation in English proposed by Pinker (1989). Specifically, based on certain analyses of the dative constructions in Japanese and Chinese and Bley-Vroman’s Fundamental Difference Hypothesis, it was hypothesized that (a) adult Japanese learners of English would have access to the syntactic consequence of ballisticness, but not to the syntactic consequence of manner of speaking, for the dative alternation in English and that (b) adult Chinese learners of English would have access to the latter, but not to the former. Thirty-two native speakers of English, thirty-two adult Japanese learners of English and thirty-two adult Chinese learners of English served as subjects. A modified version of the questionnaire containing real and made-up verbs developed by Yoshinaga (1991) and Bley-Vroman and Yoshinaga (1992) was used. Only hypothesis (b) was supported by the results. Based on the results, the possibility of selective access to UG in second language acquisition is suggested.

INTRODUCTION

It is well-known that the dative alternation in English causes a learnability problem (e.g., Baker, 1979). The following sentences illustrate this:

(1) John threw a ball to Mary.
(2) John threw Mary a ball.
(3) John pushed a ball to Mary.
(4) *John pushed Mary a ball.
(5) John told a secret to Mary.
(6) John told Mary a secret.

* This is a revised version of my Scholarly Paper (Inagaki, 1994). I would like to thank Dr. Robert Bley-Vroman and Dr. Kate Wolfe-Quintero for their helpful comments on earlier versions of this paper.

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(7) John whispered a secret to Mary.

(8) *John whispered Mary a secret.

How can children learn that sentences (4) and (8) are impossible when other sentences in the input such as (1)-(3) and (5)-(7) seem to tell them that they are possible? This is called a "learnability paradox" in the acquisition of the dative alternation (Pinker, 1989).

There have been several solutions to this paradox suggested (see Pinker, 1989 for a review), but the most elaborate and potentially workable solution so far is one proposed by Pinker (1989). He argues that children can eventually know the impossibility of (4) and (8) because they acquire the "narrow-range rules" (NRRs), the syntactic consequences of certain semantic features of the verbs, that is, children come to know how certain semantic features of the verbs are relevant to the application of the dative alternation. Thus, according to Pinker, (4) is not possible because *push belongs to "verbs of continuous causation of accompanied motion in some manner" (Gropen, Pinker, Hollander, Goldberg, & Wilson, 1989, p. 244), whereas (2) is possible because *throw belongs to "verbs of instantaneous causation of ballistic motion" (Gropen et al., 1989, p. 243). In other words, in this particular case, children come to know the syntactic consequence of ballisticness in the acquisition of the dative alternation. Regarding (6) and (8), (6) is possible because *tell belongs to "verbs of type of communicated message" (Gropen, et al., 1989, p. 244), whereas (8) is not possible because *whisper belongs to "verbs of manner of speaking" (Gropen et al., 1989, p. 244). In other words, in this case, children learn the syntactic consequence of manner of speaking, that is, how manner of speaking "prevents" the dative alternation.

Pinker (1989) further proposes the "Grammatically Relevant Subsystem" hypothesis (p. 166), which states that a set of semantic features, such as ballisticness and manner of speaking, which can potentially have syntactic consequences in a language, will be much smaller than the set of cognitively available and culturally salient distinctions and that "[l]inguistic processes, including the productive lexical rules that extend verbs to new argument structures, would be sensitive only to parts of semantic representations whose elements are members of this set."

Furthermore, Pinker (1989) suggests that the list of semantic features is innately given; that is, it is part of Universal Grammar (UG). So, according to Pinker, regarding these particular cases, children, guided by UG, can abstract the features of ballisticness and manner of speaking (not other numerous irrelevant features) and
discover their syntactic consequences in the dative alternation in English.

This theorizing by Pinker makes it possible to relate the acquisition of the NRRs to the issue of access to UG in second language (L2) acquisition (e.g., White, 1989). If, as Pinker argues, the acquisition of the NRRs is guided UG, do L2 learners have access to them or not? If they do, can they do it directly or through their first language (L1)? This has been an important issue in L2 acquisition during the last decade, and Pinker’s theory has the potential to provide a new dimension in this area, where access to UG has mainly been discussed within the framework of Chomsky’s Government and Binding Theory (e.g., Haegemann, 1991).

In this paper, after discussing Yoshinaga (1991) and Bley-Vroman and Yoshinaga (1991), a pioneering work based on Pinker’s theory, the result of a study is reported which attempts to improve and expand on the previous work. The present study is based on Bley-Vroman and Yoshinaga’s second experiment, but differs from it in two important ways: (a) This study looks at adult Chinese learners of English in addition to adult Japanese learners of English, whom Bley-Vroman and Yoshinaga also looked at; (b) This study looks at the effect of specific verb classes in contrast to Bley-Vroman and Yoshinaga, who conflated verb classes into dative and nondative classes. As will become clear later, these are crucial differences which would lead to a more precise testing of Pinker’s theory as applied to L2 acquisition.

This study also assumes, as a starting point, the correctness of Bley-Vroman’s Fundamental Difference Hypothesis (Bley-Vroman, 1989, 1990), which states that L2 learners lose their ability to access UG as adults and thus, for those who start to learn a L2 as adults, only the part of UG that is instantiated in their L1 acts as a "surrogate" for UG, because Bley-Vroman and Yoshinaga’s study was based on and seemed to support it.

**BLEY-VROMAN AND YOSHINAGA’S STUDY**

Bley-Vroman and Yoshinaga’s second experiment examined whether or not the NRRs—the syntactic consequences of certain semantic features of verb meanings—for the dative alternation in English were psychologically real for native speakers of English and adult Japanese learners of English. The subjects were eighty-five native

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1 Bley-Vroman and Yoshinaga’s experiments are reported initially in Yoshinaga (1991). The results are summarized in Bley-Vroman and Yoshinaga (1992), who also discuss their general theoretical implications. In the rest of this paper, I use Bley-Vroman and Yoshinaga as a cover term referring to both papers.
speakers of English and eighty-five adult Japanese learners of English whose proficiency was quite high (TOEFL: $M = 579.4$, $SD = 40.9$).

They used a questionnaire containing twelve short paragraphs with pictures, each of which was designed to provide the meaning of a verb and was followed by two simple sentences, whose acceptability was to be rated on a seven-point Likert scale. The sentences consisted of a prepositional dative (PD), such as (1), (3), (5), (7), and a double-object dative (DOD), such as (2), (4), (6), (8), both containing the verb just introduced by the preceding paragraph and picture. The twelve verbs used were a combination of an equal number of real and made-up verbs, which are shown in Table 1 with their verb classes (Gropen, et al., 1989, pp. 243-244).

Table 1
Verbs Used in Bley-Vroman and Yoshinaga’s Study

<table>
<thead>
<tr>
<th>Made-up verbs</th>
<th>Real verbs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOD Possible</td>
<td>doak(^a)</td>
<td>show</td>
</tr>
<tr>
<td></td>
<td>gomp(^b)</td>
<td>throw</td>
</tr>
<tr>
<td></td>
<td>pell(^c)</td>
<td>send</td>
</tr>
<tr>
<td>DOD Impossible</td>
<td>jape(^d)</td>
<td>pull</td>
</tr>
<tr>
<td></td>
<td>tonk(^d)</td>
<td>push</td>
</tr>
<tr>
<td></td>
<td>feen(^e)</td>
<td>whisper</td>
</tr>
</tbody>
</table>

\(^a\) Verbs of type of communicated message (e.g., tell/show/teach)
\(^b\) Verbs of instantaneous causation of ballistic motion (e.g., throw/kick)
\(^c\) Verbs of sending (e.g., send/mail/ship)
\(^d\) Verbs of continuous causation of accompanied motion in some manner (e.g., push/pull/carry)
\(^e\) Verbs of manner of speaking (e.g., shout/whisper/murmur)

The finding was most interesting. They found that both native and Japanese speakers showed sensitivity to the NRRs when real verbs were used but that the Japanese speakers’ apparent sensitivity to the NRRs virtually disappeared when made-up verbs were used. The native speakers were still sensitive to the NRRs when made-up verbs were used, although notably, their performance also deteriorated to some extent.

The authors’ explanation for this finding was that the NRRs were psychologically
real for the native speakers. So, when they were presented with novel verbs and their meanings, they were able to distinguish the grammaticality of DODs depending on a particular semantic class of each verb. On the other hand, since, according to their analysis of the dative construction in Japanese, the NRRs are irrelevant in Japanese, that is, the NRRs are part of UG which is not instantiated in Japanese, "[t]he Japanese subjects may develop some knowledge of dativizability of particular real verbs, due perhaps to exposure, but they have difficulty discerning the principles and applying them productively to novel cases" (Bley-Vroman and Yoshinaga, 1992, pp. 189).

This finding, Bley-Vroman and Yoshinaga argue, is consistent with Bley-Vroman’s Fundamental Difference Hypothesis, which states that L2 learners lose their ability to access UG as adults and thus, for those who start to learn a L2 as adults, only the part of UG that is instantiated in their L1 acts as a "surrogate" for UG (Bley-Vroman, 1989, 1990). Furthermore, explaining why the native speakers were better able to distinguish the grammaticality of real verbs, they state that "in addition to rules, there must be a mental association between a given verb and the syntactic frames in which it has actually been observed to occur" (p. 191).

Thus, Bley-Vroman and Yoshinaga’s claims can be summarized as follows:

1. The NRRs are psychologically real for native speakers of English, although association between certain verbs and their syntactic frames formed by exposure also seems to play a role.

2. Japanese learners, whose L1 is lacking the NRRs, have lost their access to the NRRs as adults and have no other choice but to rely on association between certain verbs and their syntactic frames formed by exposure.

SOME PROBLEMS AND LIMITATIONS OF BLEY-VROMAN AND YOSHINAGA’S STUDY

Despite their interesting methodology and findings, Bley-Vroman and Yoshinaga’s study has some potential problems and limitations, which make their claims tentative at most. Their problems and limitations are discussed below.

Problem 1. The subjects in Bley-Vroman and Yoshinaga’s study may have seen the made-up verbs as simply "code" for real verbs because some of their made-up verbs are so obviously associated with certain real verbs.

This is recognized by Bley-Vroman and Yoshinaga. They state that "the
subject may (consciously or unconsciously) see the made-up word as 'code' for a real word" (p. 193) and called for further research on this problem. If this happens, we cannot know if he/she "knows" the NRRs. Suppose you are given the verb, gorp, which means some kind of ballistic motion very similar in meaning to throw and are asked to decide on the acceptability of the sentence, *John gorp ed Mary a ball*. What should happen, if you "know" the NRR, is that you notice the semantic feature, ballisticness, and know its verb class and thus its dativezability, accepting the sentence. But, for example, if you think that gorp is throw, because the association is so obvious, and substitute throw for gorp, accepting the sentence, this does not mean that you "know" the NRR. Therefore, if made-up verbs are used which are very close in meaning to some existing verbs, we may simply be left wondering whether you "know" the NRR or you see the made-up verbs as "code" for real verbs and simply substitute. We definitely need some way of ensuring that the latter would not occur.

**Problem 2.** Bley-Vroman and Yoshinaga's analysis that Japanese has only one dative construction, which is the DOD construction, and thus the NRRs are irrelevant in Japanese may not be entirely correct.

My analysis of the dative construction and verb classes in Japanese (Inagaki, 1993a) found that, although Japanese has only one dative construction, which is either the PD construction or the DOD construction, the verb class "verbs of continuous causation of accompanied motion in some manner" does not allow that construction, whereas the verb class "verbs of instantaneous causation of ballistic motion" does allow it. The following examples illustrate this point:

   John-Nom Mary-to/Dat box-Acc push/carry/pull/lift-Pst
   "John pushed/carry/pulled/lifted a box to Mary." or
   "John pushed/carry/pulled/lifted Mary a box."

(10) *John-ga Mary-ni booru-o nage-ta/ket-ta.*
    John-Nom Mary-to/Dat ball-Acc throw/kick-Pst
    "John threw/kicked a ball to Mary." or
    "John threw/kicked Mary a ball."

This suggests that ballisticness does have syntactic consequences in the dative construction in Japanese; so, for example, os-*u* ("push") cannot occur in the dative

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2 Nom = nominative case, Dat = Dative case, Acc = accusative case, Pst = Past tense
construction, whereas nage-ru ("throw") can, in Japanese.

On the other hand, Inagaki (1993a) found that both the verb classes, "verbs of manner of speaking" and "verbs of type of communicated message" do allow the dative construction in Japanese, as is illustrated below.

    John-Nom Mary-to/Dat something-Acc whisper/shout-Pst
"John whispered/shouted something to Mary." or
"John whispered /shouted Mary something."

    John-Nom Mary-to/Dat something-Acc tell/teach/write-Pst
"John told/taught/wrote something to Mary." or
"John told/taught/wrote Mary something."

This suggests that manner of speaking does not have any syntactic consequences in the dative construction in Japanese; so, for example, both hanas-u ("tell") and sasayak-u ("whisper") can occur in the dative construction in Japanese.

If my analysis is correct, Bley-Vroman and Yoshinaga’s findings need to be reinterpreted. Among the made-up verbs Bley-Vroman and Yoshinaga used were one Tell-class verb, one Whisper-class verb, one Throw-class verb, one Send-class verb and two-Push class verbs (see Table 1). So, if we reformulate Bley-Vroman and Yoshinaga’s hypothesis based on the Fundamental Difference Hypothesis, adult Japanese learners of English will distinguish the Throw-class and Send-class verbs from the Push-class verbs, but not the Tell-class verb from the Whisper-class verb. Bley-Vroman and Yoshinaga’s finding that Japanese speakers did not show their sensitivity to the NRRs when made-up verbs were used seems surprising in terms of the reformulated hypothesis, but, since Bley-Vroman and Yoshinaga collapsed the verb classes into dativizable and nondativizable verbs, we cannot know the results in any more detail, which becomes especially problematic in light of the reformulated hypothesis.

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3 The reason why Bley-Vroman and Yoshinaga use one Send-class verb is not clear to me. To examine the sensitivity to ballisticness, they should have used another verb of ballistic motion since they used two Push-class verbs. However, this might not have affected their result partly because they did not look at specific verb classes, but dativizable and nondativizable verb classes, and Send-class verbs are dativizable in English just like Throw-class verbs and partly because Send-class verbs can occur in the dative construction just like Throw-class verbs in Japanese (Inagaki, 1993a).
**Limitation.** Even assuming that Bley-Vroman and Yoshinaga’s analysis of the dative construction in Japanese is correct, other L2 groups whose dative constructions are different from the Japanese dative construction need to be looked at to truly test the Fundamental Difference Hypothesis.

Even assuming that Bley-Vroman and Yoshinaga’s analysis of the dative construction in Japanese is correct, we cannot be sure if it is the lack of the NRRs in Japanese that caused Japanese speakers insensitivity to the NRRs. As Juffs (1993, pp. 143-144) points out, the Japanese subjects conservatism in rating the DODs containing made-up verbs could explain Bley-Vroman and Yoshinaga’s result. In other words, the Japanese subjects might have merely been less confident in rating the DODs containing made-up verbs than the native speakers.

To exclude this possibility and truly test the Fundamental Difference Hypothesis, we would need to compare Japanese speakers with a L2 group whose L1 does have the dative alternation and NRRs (which need not be the same as the NRRs in English). As an illustration, if we look at adult L2 learners who are as proficient as Bley-Vroman and Yoshinaga’s Japanese subjects and whose L1 has the same NRRs for the dative alternation as English, they should behave similarly to native speakers. If they do, this will be a real support for the Fundamental Difference Hypothesis. If they behave similarly to the Japanese speakers, the Fundamental Difference Hypothesis would not be supported and other explanations, such as conservatism, would need to be considered. In any case, this kind information would be crucial for the Fundamental Difference Hypothesis.

In order to avoid this limitation, adult Chinese learners of English are included in the present study; because the dative construction in Chinese, as analyzed below, is considerably different from the counterpart in Japanese, to include both language groups would create an ideal case for avoiding the limitation of Bley-Vroman and Yoshinaga’s study.

Huang (1994), in an attempt to expand on previous studies on the dative construction in Chinese by Li and Thompson (1981) and Wolfe-Quintero (1992), investigated the dative construction and verb classes in Chinese based on Pinker’s theory. She points out that Chinese has dative alternation similar to English, but that the verb classes in Chinese are different from those in English.

Specifically, Huang found that neither "verbs of ballistic motion" nor "verbs of continuous causation of accompanied motion" allow the DOD construction, although
they both allow the PD construction. The following examples illustrate this:

(13) John tui/uèn yí-gè xīangzi gěi Mary.
John push/carry a box to Mary
"John pushed/carried a box to Mary."

(14) *John tui/uèn Mary yí-gè xīangzi.
John push/carry Mary a box
"John pushed/carried Mary a box."

(15) John diū/tī yí-gè qiú gěi Mary.
John throw/kick a ball to Mary
"John threw/kicked a ball to Mary."

(16) *John diū/tī Mary yí-gè qiú.
John throw/kick Mary a ball
John threw/kicked Mary a box.

This suggests that ballisticness does not have any syntactic consequences in the dative construction in Chinese; so, for example, neither tuul ("push") nor diù ("throw") can occur in the DOD construction in Chinese.

On the other hand, Huang found that "verbs of manner of speaking" do not allow the DOD construction, whereas "verbs of type of communicated message" are divided into two subclasses, that is, verbs like tell and teach, which only allow the DOD construction, and verbs like read and write, which only allow the PD construction.

The following examples illustrate this:

(17) John xiāo-sheng-shuo/hān yí-gè mìmì gěi Mary tíng
John soft-voice-say/shout a secret to Mary hear
"John whispered/shouted a secret to Mary."

(18) *John xiāo-sheng-shuo/hān Mary yí-gè mìmì
John soft-voice-say/shout Mary a secret
"John whispered/shouted Mary a secret."

John tell a story to Mary
"John told a story to Mary."
b. *John jiao shuxue gei Mary.⁴
   John teach mathematics to Mary
   John taught mathematics to Mary.

(20) a. John gao5u Mary yi-ge gushi.
   John tell Mary a story
   "John told Mary a story."

       b. John jiao Mary shuxue.
       John teach Mary mathematics
       "John taught Mary mathematics."

(21) John xie/ni3n yi-feng xin gei Mary.
    John write/read a letter to Mary
    "John wrote/read a letter to Mary."

(22) *John xie/ni3n Mary yi-feng xin.
    John write/read Mary a letter
    "John wrote/read Mary a letter."

Thus, focusing on the contrast between verbs like gao5u ("tell") and verbs like han
("shout"), manner of speaking can be said to have syntactic consequences in the
dative construction in Chinese.

To summarize, Table 2 shows whether or not ballisticness and manner of
speaking are syntactically relevant in the dative constructions in English, Japanese
and Chinese.

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⁴ Li and Thompson (1981, p. 375) lists jiao ("teach") among the verbs which can occur both in PD and DOD constructions; however, Huang (1994) asked ten or so Mandarin speakers about this point and found that they all agreed that jiao only allowed the DOD construction.
Table 2

Syntactic Consequences of Ballisticness and Manner of Speaking for the Dative Constructions in English, Japanese and Chinese

<table>
<thead>
<tr>
<th></th>
<th>Ballisticness</th>
<th>Manner of Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Japanese</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Chinese</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: Yes = syntactically relevant; No = syntactically not relevant

RESEARCH QUESTIONS AND HYPOTHESES

The purpose of the present study is to examine whether or not adult Japanese and Chinese learners of English have access to the NRRs for the dative alternation in English proposed by Pinker (1989). Specifically, it is investigated whether or not adult Japanese and Chinese learners of English know the syntactic consequences of the semantic features of ballisticness and manner of speaking in rating the acceptability of the DODs in English.

The present study attempts to improve and expand on Bley-Vroman and Yoshinaga’s study, addressing the following research questions:

1. Are the NRRs for the dative alternation in English psychologically real for native speakers of English?
2. Do adult Japanese learners of English have access to the NRRs for the dative alternation in English?
3. Do adult Chinese learners of English have access to the NRRs for the dative alternation in English?
4. How do the existence and nonexistence of dative alternation in Chinese and Japanese, respectively, affect their access to the NRRs for the dative alternation in English?
5. How does familiarity (i.e., association between certain verbs and their syntactic frames formed by exposure) affect native speakers’ and adult Japanese and Chinese speakers’ sensitivity to the NRRs for the dative alternation in English?
Table 2 shows that ballisticness has syntactic consequences in English and Japanese, but not in Chinese, and that manner of speaking has syntactic consequences in English and Chinese, but not in Japanese. Therefore, based on the Fundamental Difference Hypothesis, the following hypotheses are formulated:

_Hypothesis 1_. Native speakers of English will have access to the syntactic consequences of ballisticness and manner of speaking for the dative alternation in English.

_Hypothesis 2_. Adult Japanese learners of English will have access to the syntactic consequence of ballisticness for the dative alternation in English through the L1, but not to the syntactic consequence of manner of speaking due to its absence in the L1.

_Hypothesis 3_. Adult Chinese learners of English will have access to the syntactic consequence of manner of speaking for the dative alternation in English through their L1, but not to the syntactic consequences of ballisticness due to its absence in their L1.

In addition, at a more global level, there is an important difference between Japanese and Chinese; that is, Chinese has dative alternation similar to the one in English, whereas Japanese does not. So, if the existence of the target structure in the L1 helps the learners "notice" (Schmidt, 1990, 1993) the relevant features in the L2, even if the exact nature of the target differs between the two languages, as has recently been suggested by Sorace (1993) in the case of the acquisition of clitic-climbing in Italian by French learners, then Chinese learners should be in a better position to acquire the NRRs in English than Japanese learners. Thus, we reach the fourth hypothesis:

_Hypothesis 4_. Overall, with the benefit of the existence of dative alternation in their L1, Chinese learners will be in an advantageous position, over Japanese learners, to notice and acquire the NRRs in English. Therefore, other things being equal, Chinese learners of English will be better at the NRRs than Japanese learners of English and be closer to native speakers.
The fifth hypothesis, which comes from the finding in Bley-Vroman and Yoshinaga's study that both native and Japanese speakers distinguished between dativizable and nondativizable verbs more clearly when real verbs were used, is as follows:

**Hypothesis 5.** Adult Japanese and Chinese learners of English will show more sensitivity to the NRRs including the ones not syntactically relevant in their L1s (i.e., manner of speaking for Japanese and ballisticness for Chinese) when real verbs are used, due to a familiarity effect. Native speakers of English will also show more sensitivity to the NRRs when real verbs are used due to the same familiarity effect.

**THE STUDY**

**Subjects**

The study compared three groups of thirty-two adult native speakers of English, aged eighteen to forty-five years (\(M = 28.00, SD = 8.00\) [two not reported]), thirty-two adult Japanese learners of English, aged twenty-two to forty-three years (\(M = 29.61, SD = 5.18\) [one not reported]), and thirty-two adult Chinese learners of English, aged eighteen to forty-two years (\(M = 28.33, SD = 5.41\) [two not reported]). The Chinese subjects were all Mandarin speakers, among whom twenty-two were from Taiwan and ten from the Mainland China. The subjects were either undergraduates, graduates or visiting scholars at the University of Hawai‘i during the time of the study. More precisely, of the thirty-two native speakers, eleven were undergraduates and twenty-one were graduates. Of the thirty-two Japanese speakers, seven were undergraduates and twenty-five were graduates. The Chinese speakers consisted of three undergraduates, twenty-seven graduates, and two visiting scholars.

There were two requirements for the nonnative subjects. One was high proficiency in English and the other was arrival in the U.S. (or any other English speaking country) as adults. High proficiency was required to be comparable to Bley-Vroman and Yoshinaga’s study, whose Japanese subjects were highly advanced (TOEFL: \(M = 579.4, SD = 40.9\)). The Japanese subjects TOEFL scores ranged from a low of 508 to a high of 650 (\(M = 574.89, SD = 33.48\)), whereas the Chinese subjects TOEFL scores ranged from a low of 500 to a high of 650 (\(M = 566.83, SD = 37.82\)).
Arrival as adults was required because of the relevance of this study to the Fundamental Difference Hypothesis (see above). The Japanese subjects age of arrival ranged from 17 to 40 ($M = 25.56$, $SD = 5.50$) and the Chinese subjects age of arrival ranged from 14 to 42 ($M = 26.19$, $SD = 5.69$).

**Materials**

A written form of questionnaire was used. This consisted of two parts (see Inagaki, 1994, for a complete sample of the questionnaire).

**Part 1.** Part 1 was a modification of Bley-Vroman and Yoshinaga’s questionnaire. Following instructions and one example question, eight paragraphs with pictures were presented. Each paragraph contained one made-up verb. The meaning of the made-up verb was explained in the paragraph and the picture which visually depicted the meaning. Each paragraph contained a test verb in the PD construction. Two sentences followed each paragraph. One was in the PD construction and the other in the DOD construction. These two sentences contained the made-up verb just explained by the preceding paragraph and picture. Before each sentence was a seven-point Likert scale with the numbers 3 (completely impossible in English) through 0 (unable to decide in English) to 3 (completely possible in English).

In the instructions, the subjects were asked to "read the paragraph and look at the picture to understand the meaning of the new word and then decide on the acceptability of each of the following two sentences by circling only one of the numbers." They were also asked to rate the sentences based on feelings, rather than on right or wrong. This was to tap their implicit knowledge of the NRRs. In addition, they were told not to "try to substitute a real word for the new one but to learn the new meaning of [the] new word." This was to minimize Problem 1 with Bley-Vroman and Yoshinaga’s study.

The eight paragraphs were randomly ordered. In order to control for a possible effect of morphophonology, which is claimed to exist, on the dativizability of verbs in English (see Pinker, 1989, pp. 45-47), made-up verbs which were all monosyllabic were chosen and they were further counterbalanced across paragraphs and subjects, obtaining eight versions of the questionnaire in total. Therefore, each four subjects in each language group filled in each version of the questionnaire. Made-up verbs used in each questionnaire version are shown in Table 3 with the verb class each paragraph is intended to show with a picture.
Two of the paragraphs were from Bley-Vroman and Yoshinaga’s study with some minor modifications. They were Paragraph 4 and Paragraph 6. Other paragraphs were made up by the researcher. The reason that only two of Bley-Vroman and Yoshinaga’s paragraphs were used was that the meanings of the other paragraphs of theirs seemed to be so obviously associated with those of particular real verbs in English that the made-up verbs might be mere codes for real verbs (see Yoshinaga, 1991, pp. 186-197 for a complete sample). So, in this study, utmost care was taken to create new verbs which were among intended verb classes but would not be codes for real verbs.

Another important difference from Bley-Vroman and Yoshinaga’s study was that whereas Bley-Vroman and Yoshinaga presented real and made-up verbs randomly across the paragraphs, this study presented only made-up verbs in Part 1, saving all real verbs for Part 2. This was done because presenting real and made-up verbs at the same time was thought to encourage the subjects to see the made-up verbs as

Table 3
Verb Classes and Made-up Verbs Used in Each Questionnaire Version

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Verb class</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Tell class</td>
<td>moop</td>
</tr>
<tr>
<td>2</td>
<td>Push class</td>
<td>tonk</td>
</tr>
<tr>
<td>3</td>
<td>Throw class</td>
<td>jape</td>
</tr>
<tr>
<td>4</td>
<td>Whisper class</td>
<td>feen</td>
</tr>
<tr>
<td>5</td>
<td>Tell class</td>
<td>gomp</td>
</tr>
<tr>
<td>6</td>
<td>Throw class</td>
<td>norp</td>
</tr>
<tr>
<td>7</td>
<td>Push class</td>
<td>pell</td>
</tr>
<tr>
<td>8</td>
<td>Whisper class</td>
<td>doak</td>
</tr>
</tbody>
</table>
codes for the real verbs. This was avoided in this study because by the time the subjects saw real verbs in Part 2, they had finished Part 1 and were not allowed to go back.5

Part 2. Following instructions and two example questions, eight pairs of sentences were randomly presented. One real verb in English was used for each pair. Each pair consisted of one sentence in the PD construction and one in the DOD construction. Just like Part 1, there was a seven-point Likert scale before each sentence. The purpose of this part was to compare the subjects' ratings here with those in Part 1 in order to sort out a familiarity effect hypothesized to exist in the ratings of the sentences containing real verb.

In the instructions, as in Part 1, the subjects were asked to "decide on the acceptability of each sentences by circling only one of the 7 numbers" and "to concentrate on how you feel about the sentences."

The way real verbs were presented in this study was different from the way Bley-Vroman and Yoshinaga presented their real verbs; in this study, the real verbs were presented without context (i.e., without pictures and paragraphs), whereas Bley-Vroman and Yoshinaga presented the real verbs in context (i.e., with pictures and paragraphs), just as they presented the made-up verbs. This was because it was felt that to explain the meanings of real verbs already familiar to the subjects would only create extra time.

Verb Classes

Four verb classes were chosen for this study so that we could test our hypotheses. They were the Throw class, Push class, Tell class and Whisper class.6 Two verbs were made up for each verb class for Part 1, whereas two real verbs were chosen from each verb class for Part 2. Thus, there were eight items in each part. Table 4

---

5 Between Part 1 and Part 2, there were two questions written out on one page with blanks. The questions were

1. Were there any strategies that you used for the rating of the sentences? If there were, what kinds? Please give examples if possible.
2. Did you find any principles which determined the acceptability of the sentences? If you did, what kinds?

The purpose of this section was to investigate what the subjects were aware of during the sessions. The findings in this section are not discussed in this paper, however.

6 This study did not contain Send class, which, for unknown reasons, Bley-Vroman and Yoshinaga included in their study (see Footnote 2).
shows how the paragraphs in Part 1 and the real verbs in Part 2 corresponded to each verb class.

Table 4
*Paragraphs and Real Verbs Corresponding to Each Verb Class*

<table>
<thead>
<tr>
<th>Verb class</th>
<th>Part 1</th>
<th>Part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throw class</td>
<td>Paragraph 3</td>
<td>kick</td>
</tr>
<tr>
<td></td>
<td>Paragraph 6</td>
<td>throw</td>
</tr>
<tr>
<td>Tell class</td>
<td>Paragraph 1</td>
<td>teach</td>
</tr>
<tr>
<td></td>
<td>Paragraph 5</td>
<td>tell</td>
</tr>
<tr>
<td>Push class</td>
<td>Paragraph 2</td>
<td>push</td>
</tr>
<tr>
<td></td>
<td>Paragraph 7</td>
<td>carry</td>
</tr>
<tr>
<td>Whisper class</td>
<td>Paragraph 4</td>
<td>whisper</td>
</tr>
<tr>
<td></td>
<td>Paragraph 8</td>
<td>shout</td>
</tr>
</tbody>
</table>

**Procedures**

The questionnaire was distributed to the subjects during the summer session and the fall semester of 1994. There was no time limit. This was to make sure that the subjects could figure out the meaning of the made-up verbs. Roughly speaking, it took the English speakers about 20 minutes, and the Japanese and Chinese speakers about 30 minutes, to finish the questionnaire.

**Analyses**

First, in order to directly compare the result of the present study to that of Bley-Vroman and Yoshinaga, a Three-way Repeated measures ANOVA was conducted. The design included one between-subject factor (language), which had three levels (native (NS)/Japanese (JPN)/Chinese (CHN)) and two within-subject factors (authenticity and dativizability). Authenticity had two levels (made-up verbs (MU)/real verbs(REAL)), and so did dativizability (dativizable(DAT)/nondativizable (NDAT)). This design was the same as Bley-Vroman and Yoshinaga's except for the
addition of one level (i.e., CHN) to the language factor in this study.\(^7\)

Second, another Three-way Repeated measures ANOVA was conducted. The design differed from the first one (and thus from Bley-Vroman and Yoshinaga’s) in that, instead of dativizability, verb class was included as a factor. Verb class was a within-subject factor having four levels (Throw class/Tell class/Push class/Whisper class). As was pointed out before, one of the problems with Bley-Vroman and Yoshinaga’s study was that they conflated verb classes into dativizable and nondativizable classes. This analysis was intended as a solution to this problem, examining the effect of specific verb classes.

To determine which pairs of means were significantly different, the Scheffé test was conducted when it was allowed, or else planned comparisons were used.

The Super ANOVA (Abacus Concepts, 1989) software was used for these analyses. The overall alpha level was set at 0.05, but, because two ANOVAs were performed, the alpha level was divided by 2 (\( .05/2 = .025 \)) in examining the individual comparisons in order to adjust for the possibility of spuriously significant differences due to the multiple comparisons.

**RESULTS**

In Table 5, the means and standard deviations of the ratings of the DODs by the native, Japanese and Chinese speakers in the present study are presented for different conditions including dativizability as a factor.

The results of the Three-way Repeated measures ANOVA is shown in Table 6. As in Bley-Vroman and Yoshinaga’s study, there was a significant effect for language in the present study (\( F = 17.370^*; \) \( df = 2, 93; \) \( p = 0.0001 \)).

---

\(^7\) Following Bley-Vroman and Yoshinaga’s study, the ratings of the PD construction were not included in the analysis. The rationale for this is that the NRRs for the dative alternation in English, which are the focus of this paper, are relevant only to the DOD construction and therefore, there is no point in including the PD construction in the analysis for the present purpose.
Table 5
The Means and Standard Deviations of the Ratings of the DODs by the Native, Japanese and Chinese Speakers Including Dativizability as a Factor

<table>
<thead>
<tr>
<th></th>
<th>REAL</th>
<th></th>
<th>MU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>REAL</td>
<td></td>
<td>MU</td>
</tr>
<tr>
<td>NS</td>
<td></td>
<td>2.09</td>
<td>(0.72)</td>
<td>1.90</td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td>0.63</td>
<td>(1.88)</td>
<td>0.55</td>
</tr>
<tr>
<td>NDAT</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>JPN</td>
<td></td>
<td>0.21</td>
<td>(0.92)</td>
<td>0.40</td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td>1.41</td>
<td>(1.18)</td>
<td>0.37</td>
</tr>
<tr>
<td>NDAT</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>CHN</td>
<td></td>
<td>0.91</td>
<td>(1.08)</td>
<td>0.96</td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td>0.70</td>
<td>(1.51)</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Note: M (SD)

Table 6
The Result of the Three-way Repeated Measures ANOVA Including Dativizability as a Factor

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>2</td>
<td>103.975</td>
<td>51.987</td>
<td>17.370*</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>278.345</td>
<td>2.993</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>223.184</td>
<td>223.184</td>
<td>173.050*</td>
<td>0.0001</td>
</tr>
<tr>
<td>D x L</td>
<td>2</td>
<td>12.858</td>
<td>6.429</td>
<td>4.985*</td>
<td>0.0088</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>119.943</td>
<td>1.290</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>21.447</td>
<td>21.447</td>
<td>12.996*</td>
<td>0.0005</td>
</tr>
<tr>
<td>A x L</td>
<td>2</td>
<td>1.497</td>
<td>0.749</td>
<td>0.454</td>
<td>0.6368</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>153.478</td>
<td>1.650</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D x A</td>
<td>1</td>
<td>20.281</td>
<td>20.281</td>
<td>29.023*</td>
<td>0.0001</td>
</tr>
<tr>
<td>DxAxL</td>
<td>2</td>
<td>2.838</td>
<td>1.419</td>
<td>2.031</td>
<td>0.1370</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>64.990</td>
<td>0.699</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant at 0.025

L = language; D = dativizability; A = authenticity
Table 7
Scheffé Test of Differences in Ratings of the DOD Construction among Native, Japanese and Chinese Speakers

<table>
<thead>
<tr>
<th></th>
<th>Diff.</th>
<th>Crit. diff.</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPN</td>
<td>0.559</td>
<td>0.538</td>
<td>0.0399</td>
</tr>
<tr>
<td>CHN</td>
<td>1.271</td>
<td>0.538</td>
<td>0.0001*</td>
</tr>
<tr>
<td>NS</td>
<td>0.713</td>
<td>0.538</td>
<td>0.0059*</td>
</tr>
</tbody>
</table>

* Significantly different at 0.025

To locate where the difference was, Scheffé tests were conducted. The results are shown in Table 7. Notice that the native speakers in the present study rated the sentences in the DOD construction overall as more acceptable than the Chinese speakers, who in turn rated them as more acceptable than the Japanese speakers. The Japanese speakers' conservatism in rating the DOD construction compared to the native speakers was also found in Bley-Vroman and Yoshinaga's study. As in Bley-Vroman and Yoshinaga's study, there was a significant two-way interaction between dativezability and language. This indicates that the native speakers distinguished the DODs containing dativezable verbs from those containing nondativezable verbs more clearly than the Japanese and Chinese speakers. The difference between native and Japanese speakers in this regard was also found in Bley-Vroman and Yoshinaga's study. As was the case with Bley-Vroman and Yoshinaga's study, there was a two-way interaction between dativezability and authenticity in the present study, reflecting the fact that all the three groups distinguished between the DODs containing dativezable and those containing nondativezable verbs more clearly when the verbs were real. In Table 8, the means and standard deviations of the ratings of the DODs by the native, Japanese and Chinese speakers in the present study are presented for different conditions including verb class as a factor.
### Table 8

*The Means and Standard Deviations of the Ratings of the DODs by the Native, Japanese and Chinese Speakers Including Verb Class as a Factor*

<table>
<thead>
<tr>
<th></th>
<th>REAL</th>
<th>MU</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throw class</td>
<td>1.41 (1.38)</td>
<td>1.77 (1.19)</td>
</tr>
<tr>
<td>Tell class</td>
<td>2.78 (0.38)</td>
<td>2.03 (1.16)</td>
</tr>
<tr>
<td>Push class</td>
<td>-0.72 (2.16)</td>
<td>0.91 (1.80)</td>
</tr>
<tr>
<td>Whisper class</td>
<td>-0.53 (1.87)</td>
<td>0.19 (1.96)</td>
</tr>
<tr>
<td>JPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throw class</td>
<td>-1.77 (1.18)</td>
<td>-0.11 (1.71)</td>
</tr>
<tr>
<td>Tell class</td>
<td>2.19 (1.34)</td>
<td>0.91 (1.60)</td>
</tr>
<tr>
<td>Push class</td>
<td>-2.09 (1.11)</td>
<td>-0.19 (1.49)</td>
</tr>
<tr>
<td>Whisper class</td>
<td>-0.73 (1.86)</td>
<td>0.55 (1.74)</td>
</tr>
<tr>
<td>CHN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throw class</td>
<td>-0.81 (1.85)</td>
<td>0.55 (2.00)</td>
</tr>
<tr>
<td>Tell class</td>
<td>2.64 (0.81)</td>
<td>1.38 (1.37)</td>
</tr>
<tr>
<td>Push class</td>
<td>-1.28 (1.59)</td>
<td>0.22 (1.73)</td>
</tr>
<tr>
<td>Whisper class</td>
<td>0.11 (2.01)</td>
<td>0.45 (1.84)</td>
</tr>
</tbody>
</table>

Note: M (SD)
Table 9
The Result of the Three-way Repeated Measures Anova Including Verb Class as a Factor

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>2</td>
<td>207.950</td>
<td>103.975</td>
<td>17.370*</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>556.690</td>
<td>5.986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC</td>
<td>3</td>
<td>765.152</td>
<td>255.051</td>
<td>115.703*</td>
<td>0.0001</td>
</tr>
<tr>
<td>VC x L</td>
<td>6</td>
<td>84.863</td>
<td>14.144</td>
<td>6.416*</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>279</td>
<td>615.017</td>
<td>2.204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>42.894</td>
<td>42.894</td>
<td>12.996*</td>
<td>0.0005</td>
</tr>
<tr>
<td>A x L</td>
<td>2</td>
<td>2.994</td>
<td>1.497</td>
<td>0.454</td>
<td>0.6368</td>
</tr>
<tr>
<td>Error</td>
<td>93</td>
<td>306.956</td>
<td>3.301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC x A</td>
<td>3</td>
<td>212.519</td>
<td>70.840</td>
<td>47.239*</td>
<td>0.0001</td>
</tr>
<tr>
<td>VC x A x L</td>
<td>6</td>
<td>25.120</td>
<td>4.187</td>
<td>2.792*</td>
<td>0.0118</td>
</tr>
<tr>
<td>Error</td>
<td>279</td>
<td>418.392</td>
<td>1.500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant at 0.025
L = language; VC = verb class; A = authenticity

The results of the Three-way Repeated measures ANOVA are shown in Table 9. The crucial finding which is relevant to all the hypotheses proposed before is a significant three-way interaction among verb class, authenticity and language ($F = 2.792*; df = 6, 279; p = 0.0118$). Because of its importance, detailed analysis of this interaction is provided below. The nature of the interaction is visually presented for each language group in Figure 1.
Figure 1
*Mean Differences in Ratings of the Dods Containing Real and Made-up Verbs That Are among Throw Class, Push Class, Tell Class and Whisper Class in the Native, Japanese and Chinese Speakers*

Native speakers

![Chart showing mean differences in ratings for native speakers.](chart)

Japanese speakers

![Chart showing mean differences in ratings for Japanese speakers.](chart)
Figure 2 indicates that this interaction effect was caused by the fact that the native speakers differentiated the DODs containing Throw-class verbs from those containing Push-class verbs more clearly than the Japanese and Chinese speakers, especially when the verbs were real. (Notice the line between the Throw class and Push class is steeper in the case of NS, REAL than in the cases of JPN, REAL and CHN, REAL.)

In order to examine how well each language group distinguished between Throw-class and Push-class verbs, and between Tell-class and Whisper-class verbs, depending on whether the verbs were real or made-up, planned comparisons were conducted for each language group. The results are shown in Table 11.
Table 10

Planned Comparisons of the Ratings of the DODs Containing Throw-class Verbs to Those Containing Push-class Verbs, and of the Ratings of the DODs Containing Tell-class Verbs to Those Containing Whisper-class Verbs, for Real and Made-up Verbs in the Native, Japanese and Chinese Speakers

<table>
<thead>
<tr>
<th></th>
<th>REAL</th>
<th></th>
<th>MU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>p</td>
<td>F</td>
<td>p</td>
</tr>
<tr>
<td>Throw vs. Push class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>63.942*</td>
<td>0.0001</td>
<td>10.458*</td>
<td>0.0017</td>
</tr>
<tr>
<td>JPN</td>
<td>1.251</td>
<td>ns</td>
<td>0.071</td>
<td>ns</td>
</tr>
<tr>
<td>CHN</td>
<td>1.765</td>
<td>ns</td>
<td>0.865</td>
<td>ns</td>
</tr>
<tr>
<td>Tell vs. Whisper class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>155.375*</td>
<td>0.0001</td>
<td>48.136*</td>
<td>0.0001</td>
</tr>
<tr>
<td>JPN</td>
<td>99.183*</td>
<td>0.0001</td>
<td>24.531*</td>
<td>0.0001</td>
</tr>
<tr>
<td>CHN</td>
<td>60.753*</td>
<td>0.0001</td>
<td>26.848*</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

* Statistically significant at 0.025; all df = 1,31

Table 10 shows that the native speakers distinguished between the DODs containing Throw-class verbs and those containing Push-class verbs, and between the DODs containing Tell-class verbs and those containing Whisper-class verbs, regardless of whether the verbs were real or made-up. On the other hand, it shows that the Japanese and Chinese speakers did not distinguish between the DODs containing Throw-class verbs and those containing Push-class verbs regardless of whether the verbs were real or made-up, while both language groups distinguished between the DODs containing Tell-class verbs and those containing Whisper-class verbs regardless of whether the verbs were real or made-up.

DISCUSSION

Hypothesis 1 was supported. The planned comparisons clearly showed that the adult native speakers of English distinguished between the DODs containing Throw-class verbs and those containing Push-class verbs, and between the DODs
containing Tell-class verbs and those containing Whisper-class verbs, regardless of whether the verbs were real or made-up. Especially significant is the fact that they were sensitive to the NRRs even when the verbs were made-up. This suggests that the NRRs are psychologically real for adult native speakers of English. This is consistent with Bley-Vroman and Yoshinaga’s result. Hypothesis 2 was entirely rejected. The planned comparisons showed that the Japanese subjects did not distinguish between the DODs containing Throw-class verbs and those containing Push-class verbs but that they did distinguished between the DODs containing Tell-class verbs and those containing Whisper-class verbs, regardless of whether the verbs were real or made-up. This is the opposite of our prediction. It suggests that adult Japanese learners of English have access to the syntactic consequence of manner of speaking, but not of ballisticness, despite the fact that the latter seems to be instantiated in their L1. The Japanese speakers’ sensitivity to the syntactic consequence of manner of speaking even when made-up verbs were used is an embarrassment to the Fundamental Difference Hypothesis. If it is correct that manner of speaking is not syntactically relevant in the dative construction in Japanese, this indicates that the Japanese speakers must have had access to the syntactic consequence of manner of speaking in the dative alternation in English starting as adults. In other words, they seem to have accessed UG, which is the opposite of what the Fundamental Difference Hypothesis predicts.

Furthermore, the Japanese speakers’ insensitivity to the syntactic consequence of ballisticness, regardless of whether the verbs were real or made-up, is an embarrassment to the Fundamental Difference Hypothesis, too. If it is correct that ballisticness is syntactically relevant in the dative construction in Japanese, this suggests that the Japanese speakers did not have access to the syntactic consequence of ballisticness despite its existence in their L1. In other words, they did not have access to the part of UG which was instantiated in their L1, which is the opposite of what the Fundamental Difference Hypothesis predicts.

One possibility is that the dative construction in Japanese is similar to the PD construction, but not to the DOD construction at all, in English, or at least so perceived by Japanese learners of English. If this is the case, adult Japanese learners would have to tackle the DOD construction in English from scratch. Neither the existence of the syntactic consequence of ballisticness nor the nonexistence of the syntactic consequence of manner of speaking in the dative construction in Japanese would play a role.
Assuming that this is what actually happens, the result in the present study suggests that adult Japanese learners of English have access to the syntactic consequence of manner of speaking, but not of ballisticness. Thus, this leads us to the possibility of selective access to UG; that is, some aspects of UG can be accessed by adult L2 learners but others cannot be, or alternatively, some aspects of UG are more or less easier for adult L2 learners to access than others. In this particular case, it might be either that the syntactic consequence of manner of speaking can be accessed by adult L2 learners, but the syntactic consequence of ballisticness cannot be, or that the syntactic consequence of manner of speaking is easier for adult L2 learners to access than that of ballisticness.

Hypothesis 3 was supported. The planned comparisons clearly showed that when the verbs were made-up, the Chinese speakers distinguished between the DODs containing Tell-class verbs and those containing Whisper-class verbs, but not between the DODs containing Throw-class verbs and those containing Push-class verbs. This is what is predicted by the Fundamental Difference Hypothesis. Thus, the result suggests that adult Chinese learners of English have access to the syntactic consequence of manner of speaking for dative alternation in English through their L1, but not to the syntactic consequence of ballisticness due to its absence in their L1.

The possibility of selective access to UG, mentioned above, can also handle the result, however. Although, given the similarities between the dative constructions in English and Chinese, it is most likely that the Chinese learners had access to the syntactic consequence of manner of speaking through their L1, their inability to access the syntactic consequence of ballisticness can easily be handled if we assume that adult L2 learners simply cannot access the syntactic consequence of ballisticness.

Hypothesis 4 was not supported. There was no difference between the Japanese and Chinese subjects in this study, except that the Chinese speakers generally rated the DODs higher than the Japanese speakers and thus were closer to the native speakers. This was shown by the result of the Scheffé test. Although it could be argued that the difference suggests that with the benefit of the existence of dative alternation in their L1, the Chinese subjects were more confident in rating the DODs than the Japanese subjects, this could only trivially be true in light of the fact that these two language groups did not differ at all in terms of the sensitivity to the NRRs, as shown by the planned comparisons. Again, this lack of difference might have simply been due to adult L2 learners inability to access the syntactic consequence of ballisticness and ability to access the syntactic consequence of manner of speaking in
Hypothesis 5 was partly supported. In general, all the three language groups distinguished between dativizable and nondativizable verbs more clearly when real verbs were used than when made-up verbs were used, as is indicated by the two-way interaction between dativizability and authenticity. This is consistent with the hypothesis and another support for Bley-Vroman and Yoshinaga’s claim that both native and adult L2 learners show more sensitivity to the NRRs when real verbs are used due to a familiarity effect.\(^8\)

However, there is an exception to this general pattern: Figure 1 indicates that the Japanese and Chinese subjects did not distinguish between the Throw and Push classes anymore clearly when real verbs were used than when made-up verbs were used. In other words, it seems that familiarity did not increase adult Japanese and Chinese learners’ sensitivity to the syntactic consequence of ballisticness. Clearly, this is not predicted by the hypothesis.

As for Japanese speakers, the low ratings of the DODs containing Throw-class verbs even when the verbs were real may suggest that the dative construction in Japanese is in fact perceived by them to be similar to the PD construction, not the DOD construction, in English, which might in turn make it difficult for them to notice the DOD construction containing Throw-class verbs in English.\(^9\) As for Chinese speakers, this may suggest that the existence of the dative construction in Chinese containing Throw-class verbs which is a near equivalence to the PD construction in English might hinder them from noticing the DOD construction containing Throw-class verbs in English.\(^10\)

Interestingly, Figure 1 indicates an asymmetry between Throw-class and Push-class verbs, on the one hand, and Tell-class and Whisper-class verbs, on the other; that is, all the three language groups differentiated between Tell-class verbs and Whisper-class verbs more clearly than between Throw-class verbs and Push-class verbs. The fact that even the native speakers revealed this pattern is surprising and

\(^8\) See Inagaki (1993b) for the role of familiarity in the acquisition of other aspects of the dative alternation in English (i.e., the possession constraint and the morphological constraint) by adult English and Japanese speakers.

\(^9\) As support for this, the PDs containing Throw-class verbs that were real were rated high \((M = 2.72; SD = 0.41)\) by the Japanese subjects.

\(^10\) As support for this, the PDs containing Throw-class verbs that were real were rated high \((M = 2.94; SD = 0.17)\) by the Chinese subjects.
nowhere in Pinker's theory is this predicted. One possibility is that this is only an artifact of the instrument used in this study, especially given the fact that there were only two items containing real verbs and two items containing made-up verbs for each verb class. Another more interesting possibility is that this truly reflects a difference between the nature of ballisticness and manner of speaking; that is, perhaps, the difference between Throw-class verbs and Push-class verbs is subtler and thus harder to access than the difference between Tell-class verbs and Whisper-class verbs. If this is indeed the case, it might be another support for the possibility of selective access to UG, suggested above.

CONCLUSIONS

The results of the present study would provide the following answers to our research questions:

1. The NRRs for the dative alternation in English are psychologically real for native speakers of English.

2. Adult Japanese learners of English have access to the syntactic consequence of manner of speaking, despite its nonexistence in their L1, but not to the syntactic consequence of ballisticness, despite its existence in their L1, for the dative alternation in English.

3. Adult Chinese learners of English have access to the syntactic consequence of manner of speaking through their L1, but not to the syntactic consequence of ballisticness, which is nonexistent in their L1, for the dative alternation in English.

4. The existence and nonexistence of dative alternation in Chinese and Japanese, respectively, do not affect their access to the NRRs for the dative alternation in English.

5. Familiarity increases native speakers' sensitivity to the syntactic consequences of manner of speaking and ballisticness for the dative alternation in English, whereas it only increases adult Japanese and Chinese speakers' sensitivity to the former, but not to the latter.

Conclusion 2 is the opposite of what the Fundamental Difference Hypothesis predicts, and this has led us to the possibilities that the dative construction in Japanese is perceived to be similar to the PD construction in English by adult Japanese learners of English and that some aspects of UG can be accessed by adult L2 learners, but others
cannot, or alternatively, some aspects of UG are more or less easier for adult L2 learners to access than others. The latter possibility might be called selective access to UG. In the case of the NRRs, it might be either that the syntactic consequence of ballisticness cannot be accessed by adult L2 learners, but the syntactic consequence of manner of speaking can be or that the former is easier for adult L2 learners to access than the latter. This possibility could also handle conclusions 3 and 4. The big question is "What determines the accessibility or the difficulty?", to which there is no answer at this stage and further research is necessary in this area. Conclusion 5 has led us to the following speculations:

1. Japanese speakers’ perception that the dative construction in Japanese is similar to the PD construction in English makes it difficult for them to notice the DOD construction containing Throw-class verbs in English.
2. The fact that in Chinese, Throw-class verbs can only occur in the PD construction makes it difficult for Chinese speakers to notice the DOD construction containing Throw-class verbs in English.

Therefore, the overall picture that the present study provides us with is a complex one. It seems that adult L2 learners performance is shaped partially by UG, by the instantiation of UG in the L1, by their perception of the target structure in the L2 and its status in their L1, by exposure to the target structure, and by the noticeability of the target structure, perhaps determined by an interaction of the other factors.\footnote{Similar ideas have recently been expressed by Bley-Vroman and Yoshinaga (1992, pp. 196-197) and Sorace (1993, p. 44).}

The last factor, noticeability, seems crucial; however, unfortunately, it seems that current research in this area, represented by Schmidt’s work (e.g., Schmidt, 1990, 1993), is typically not explicit about specific target structures in the L2 and their status in the L1, whereas UG-based L2 research, represented by White’s work (e.g., White, 1989, 1991), although explicit about specific target structures in the L2 and their status in the L1, does not typically consider noticeability in any detail. Therefore, further research is needed which attempts to fill the gap between these two camps.\footnote{A different (and potentially more plausible) interpretation of the results of the present study is offered in Inagaki (1995).}
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