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中部地区英語教育学会

『紀要３3』２００３

２００４年３月５日 印刷
２００４年３月15日 発行

編集者 中部地区英語教育学会
発行者 中部地区英語教育学会

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Tel: 054-255-4862
Fax: 054-253-2309
Japanese Learners' Knowledge
of the Constraint on Non-head Nouns inside Deverbal Noun Compounds in English
英語の脱動詞的複合名詞内の非主要部名詞に関する制約と
それについての日本人学習者の知識

Key Words: Second Language Acquisition, Morphology, Deverbal Noun Compounds

Ken Urano
浦野 研

If you ask a native speaker of English what to call someone who eats rats, he or she would probably say "A rat-eater," but would almost never say "A rats-eater." This is the case because of the constraint that prohibits non-head nouns (NHNs) from being pluralized inside X-doer type noun compounds (also known as deverbal compounds or synthetic compounds). It is also worth noting that this constraint does not apply to irregular plurals in the same way: compounds like mice-eater are somehow considered acceptable, although singular nouns (e.g., mouse-eater) are still preferred.

Theoretical attempts have been made to account for this constraint and the difference between regular and irregular nouns with regard to it, but I will not go into the details due to lack of space (for review and discussion of such attempts, see, for example, Gordon, 1985; Kiparsky, 1982; Lardiere, 1995a, 1995b; Marcus, 1995; Pinker, 1991, 1999). What I will focus on instead is the acquisition of such a constraint both by first language learners and second language learners. More precisely, I will report on the results of an experiment that investigated Japanese learners' knowledge of this particular constraint. Before describing the study, I will first review relevant empirical findings in previous studies.

First and Second Language Acquisition of the Constraint

Gordon (1985) was the first study that investigated the acquisition of the constraint on NHNs inside deverbal noun compounds in English. In this experimental study, Gordon elicited deverbal noun compounds from 33 English-speaking children by asking "What do you call someone who eats X?" The subjects, who were divided into three age groups with the means of 3;8, 4;6, and 5;6 (ns = 11, 11, & 11, respectively), frequently produced irregular plurals inside compounds (e.g., mice-eater), but they almost never produced regular plurals inside compounds (e.g., rats-eater). Approximately 90% of the irregular nouns were pluralized while only 2% of regular nouns were. Results of this study suggest that (a) children clearly distinguish regular nouns from irregulars, and (b) children are sensitive to the constraint regarding the use of plural nouns inside deverbal compounds. Based on the fact that even children in the youngest group distinguished regulars from irregulars clearly, Gordon further argues that the constraint must be
innately available. In other words, he claims that children have not received enough evidence in the input by the time they are able to distinguish regular nouns from irregulars inside deverbal compounds.

Gordon's study on first language (L1) learners has stimulated second language (L2) acquisition researchers to conduct similar experiments. Lardiere (1995a), Murphy (2000), and Urano (2001) all employed the elicitation task similar to Gordon's¹. Lardiere (1995a) and Murphy (2000) also tested adult native speakers of English as control groups. Results of these studies, including Gordon's (1985), are graphically summarized in Figure 1.

![Graph showing percentage for singular NHNs inside deverbal compounds in previous studies](image)

**Figure 1.** Percentage for singular NHNs inside deverbal compounds in previous studies

Two points need mentioning. First, there is a clear difference in production of regular plurals between native speakers and nonnative speakers. Native speakers of English (both children in Gordon, 1985, and adults as the control groups in Lardiere, 1995a, & Murphy, 2000) almost never produced regular plurals inside deverbal compounds (e.g., *rats-eater*), while nonnative speakers did so quite substantially (30-73% of the utterances with regular nouns). Second, although L2 learners seem to have violated the constraint in question, they still treated regulars and irregulars differently. In other words, they were less willing to produce regular plurals inside compounds than irregular ones.

There has been a debate over the interpretation of these findings. Marcus (1995) claims that the fact that regular and irregular plurals are treated differently suggests that L2 learners have already acquired the constraint. He goes on to argue that the absolute numbers are not crucial since there are always sources of *noise* in such experimental studies. Lardiere (1995a, 1995b)
argues against Marcus pointing out that L2 learners clearly violated the constraint (i.e., regular plurals are not allowed inside compounds). If L2 learners had the accurate knowledge of the constraint, they should not produce regular plurals at all inside compounds. What Marcus calls noise seems beyond an acceptable level considering the fact that the data produced by L1 children in Gordon (1985) do not include so much of it. Marcus needs to explain why more noise is involved in the adult L2 studies than in the child L1 study.

There is another important issue that has not been addressed in previous studies. Although the central issue in these studies is whether or not learners have acquired, or know, the constraint, they did not test the knowledge of the learners. The fact that some L2 learners did not produce regular plurals inside deverbal compounds does not necessarily mean that they knew that regular plurals were not allowed there. Put another way, there is a possibility that those subjects simply preferred the singular nouns to plurals while they still believed that both singular and plural nouns were acceptable. In order to clear this ambiguity, an empirical study is necessary that investigates the knowledge of L2 learners, not their production. The experiment reported in the following section attempted to do this.

Method

Subjects

Fifty native speakers of Japanese enrolled in the first-year English language program at Hokkai-Gakuen University, Sapporo, participated in the experiment. They were all business administration majors who had studied English as a school subject for six or more years by the time of the experiment. Twenty of them were excluded from the analyses since the vocabulary test administered after the experiment revealed that they did not know the plural forms of the target nouns. Thus, data from the remaining thirty subjects were used for the subsequent analyses.

Materials

Unlike previous studies, an acceptability judgment task was employed in the present study for the reason mentioned above. Subjects read sentences like *A person who paints bones can be called a bones painter*, and were then asked whether or not they thought the sentence was acceptable. A four-point Likert scale was used for judgment, 3 being acceptable, 2 somewhat acceptable, 1 somewhat non-acceptable, and 0 non-acceptable. Four irregular nouns were chosen from those used in the previous studies, and four regular plural nouns were selected to semantically match the irregular ones. Each pair of nouns was then matched with a verb to create sixteen deverbal noun compounds in total (See Table 1 for the complete list of words). In addition, twenty distractor items were included in the experiment.
Table 1. Noun pairs used in the experiment

<table>
<thead>
<tr>
<th>irregular nouns</th>
<th>regular nouns</th>
<th>verb-er</th>
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<tbody>
<tr>
<td>singular</td>
<td>plural</td>
<td>singular</td>
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<tr>
<td>foot</td>
<td>feet</td>
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<td>woman</td>
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<td>child</td>
<td>children</td>
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<td>tooth</td>
<td>teeth</td>
<td>bone</td>
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</table>

Procedure

All the test sentences (see Appendix) were typed into a Microsoft PowerPoint file and presented on a big screen using a projector in front of the subjects. Before the experiment, the subjects were given an instruction in Japanese as well as practice items that followed the instruction. Each test sentence was presented for 12 seconds using the timing function of PowerPoint, and was followed by the next sentence with a 5-second interval.

Results

Main results

The means and standard deviations for the judgment task are presented in Figure 2. A one-way analysis of variance with the within-subject design was conducted and the main effect was found to be statistically significant ($F(3/87) = 4.979, p = .003$). Therefore, post-hoc paired $t$-tests with the Bonferroni adjustment were computed, and the results indicated that the mean acceptability score for regular plurals inside deverbal compounds was significantly lower than the mean scores in the other three conditions. This suggests that the subjects as a group recognized that the use of regular plurals inside deverbal compounds was less acceptable.

![Means and standard deviations for acceptability judgment (n = 30)](image_url)

Figure 2. Means and standard deviations for acceptability judgment ($n = 30$)
Individual learners

In addition to the overall analysis presented above, the data were further analyzed to investigate whether there was any individual difference among subjects. First, I recoded subjects’ responses by grouping Scales 3 (acceptable) and 2 (somewhat acceptable) together as “acceptances” and Scales 1 (somewhat non-acceptable) and 0 (non-acceptable) together as “non-acceptances.” Table 2 presents the frequency of “acceptances” of the four conditions by individual subjects.

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<thead>
<tr>
<th>ID</th>
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Notes. SG: singular  PL: plural

Remember that regular plurals are not allowed inside deverbal compounds in English and therefore regular singulars must be accepted in the native grammar. Table 2 shows that three out of thirty subjects (i.e., Subjects 8, 18, & 27) consistently accepted regular singulars inside compounds and at the same time consistently rejected regular plurals in the same position. In other words, these three subjects seem to have the accurate knowledge of the constraint on NHNs inside compounds. If we lower the standard, nine of the subjects (i.e., Subjects 1, 8, 13, 14, 17, 18, 27, 28, & 30) correctly accepted three or more of the regular singulars inside compounds and correctly rejected three or more of the regular singulars at the same time. A closer look at the data indicated that, depending on the criteria, 10-30% of the subjects made the native-speaker judgment.

Even though the rest of the subjects did not make the native-speaker judgment consistently, it is important to note that many of them accepted more regular singulars than regular plurals. In
fact, 18 of the 30 subjects, i.e., 60%, did so while only 6 subjects, or 20%, accepted more plurals than singulars.

**Discussion**

Although the present study employed an acceptability judgment task, the overall results were quite similar to those in the previous studies that used elicitation tasks. This may suggest that subjects’ production of more regular singular nouns inside deverbal compounds than regular plurals reported in the previous studies was based on their knowledge of the constraint. In other words, it is possible that those subjects had intuition that regular plurals are not allowed inside deverbal noun compounds. However, subjects in the previous studies did in fact produce regular plurals inside compounds, though not as frequently as irregular plurals, which led to the debate over the acquisition of such knowledge. The same was true in the present study. Although there was an overall tendency to accept more regular singulants than regular plurals, the majority of the subjects did not consistently reject the use of regular plurals inside deverbal noun compounds. These findings suggest that at least some subjects had not acquired the knowledge of the constraint in question.

It would be of some interest to point out that transfer from the L1 knowledge would have given the subjects the correct intuition of the constraint on NHNs. The X-doer type compounding is known to be productive in Japanese (Sugioka, 1995-1995, p. 234), and the root form of the verb is attached to the NHN, like *hito-goroshi* (‘man-kill,’ meaning murderer), to create a compound. Japanese plural marking by suffixes like *-tati, -ra*, and *-domo* is optional (Ishii, 2000), and NHNs inside Japanese deverbal compounds cannot be pluralized. Therefore, compounds like *hae-tati-tataki* (‘fly-PL-hit,’ meaning fly-swatter) and *usi-tati-kai* (‘cow-PL-keep,’ meaning cow-herder) are not acceptable in Japanese. However, results of the present study show that many subjects accepted plural NHNs inside deverbal compounds. What is puzzling is that their interlanguage grammar is different from both their L1 rule (i.e., plural NHNs are not allowed in Japanese) and the target-language rule (i.e., the same is true in English). The question remains as to where such knowledge comes from.

It is also important to note that there were a few subjects who apparently had the native-speaker knowledge of the constraint. As the analysis of individual subjects shows (see Table 2), at least three of the subjects seem to have made their judgments consistently based on the accurate knowledge of the constraint, and several others made similar judgments, though not as consistently as the three. In addition, more than half of the subjects preferred regular singulants than regular plurals inside deverbal compounds. Based on these findings, it might be possible to assume that the learning process of this particular constraint is gradual rather than categorical. In other words, L2 learners may not find out in a particular moment that regular
plurals cannot come inside deverbal compounds then use such knowledge all the time afterwards. This might lead to an idea that associative learning proposed by the connectionist model, rather than rule learning, is taking place in L2 learners' mind, but much more theoretical and empirical discussion is necessary before entertaining such a possibility (for discussion along this line, see Murphy, 2000; Murphy & Hayes, 2002)³.

Conclusion

The present study provided additional information on L2 learners knowledge of the constraint on NHNs inside deverbal noun compounds in English by following up on previous studies using different experimental tasks. However, it has not yet answered some important questions such as (a) where the interlanguage knowledge comes from, and (b) how the constraint on NHNs is learned. Further investigation, both theoretical and empirical, is anticipated to provide a clearer picture on these issues.

(Hokkai-Gakuen University)

Notes

1. In Murphy (2000), written rather than spoken elicitation was used due to the fact that French learners of English tend to devoice word final consonants. This could have made coding of the elicited utterances very difficult especially because the crucial point is whether or not subjects produced the plural –s in the word final position.

2. Originally, another noun pair, i.e., mouse and rat, was also included in the experiment, but was later excluded from the analyses since many subjects could not produce the plural form for mouse in the vocabulary test administered after the experiment.

3. An associative learning model is not without problems, either. For example, such an account should predict that very advanced learners with plenty of exposure to the target language have learned the constraint. However, Urano (2001) reports that some of his subjects with very high proficiency in English still incorrectly produced regular plurals inside deverbal compounds.

References


Dordrecht, the Netherlands: Foris Publications.

Appendix

Test sentences (in the order of appearance in the experiment)

A person who plays tennis can be called a tennis player. A person who eats nice can be called a nice eater.
A person who washes hands can be called a hander. A person who teaches can be called a teacher.
A person who sells water can be called a waterist. A person who paints teeth can be called a teether.
A person who washes hands can be called a hand washer. A person who eats rats can be called a rattist.
A person who sells water can be called a water seller. A person who eats mice can be called a mouse eater.
A person who teaches can be called a teachist. A person who hates women can be called a woman hater.
A person who plays the piano can be called a pianor. A person who washes feet can be called a foot washer.
A person who kisses babies can be called a babist. A person who drinks wine can be called a wine drinker.
A person who hates women can be called a womaner. A person who hates girls can be called a girler.
A person who kisses children can be called a childist. A person who hates girls can be called a girl hater.
A person who kisses children can be called a children kisser. A person who washes feet can be called a footer.
A person who gives feet can be called a feet washer. A person who drinks wine can be called a winer.
A person who plays the piano can be called a pianist. A person who plays the piano can be called a pianist.
A person who washes hands can be called a hands washer. A person who eats mice can be called a mousist.
A person who paints bones can be called a bone painter. A person who paints bones can be called a boner.
A person who eats rats can be called a rats eater. A person who eats rats can be called a rat eater.
A person who paints teeth can be called a teeth painter. A person who kisses babies can be called a baby kisser.
A person who rates girls can be called a girls hater. A person who paints babies can be called a baby painter.
A person who kisses babies can be called a babies kisser. A person who kisses children can be called a child kisser.
A person who plays tennis can be called a tenniser. A person who plays tennis can be called a tenniser.
A person who hates women can be called a woman hater.