

Review on Acquisition of Number Features by Japanese Learners of English

教育内容開発コース 加藤 絵美

Emi KATO

In second language acquisition research, the possibility that second language learners are able to acquire grammatical features which do not exist in their first language has been a subject of controversy. It is crucial to investigate the acquisition of number features by Japanese learners of English because English has number features but Japanese does not. This article reviews the hypotheses on acquisition of features and the previous studies on the acquisition of number features, mainly on learners' sensitivity to third person singular present *-s*.

Table of content

1. Introduction
2. Acquisition order
3. Hypotheses in second language acquisition
 - 3.1 Impairment hypothesis
 - 3.2 Missing Surface Inflection hypothesis
4. Studies on number feature agreement by Japanese learners
 - 4.1 Self-paced reading task
 - 4.2 ERP study
5. Discussion and conclusion

1. Introduction

Japanese learners of English often have difficulty in acquisition of number features. It has been reported that they often fail to produce plural *-s* on noun and third person singular *-s* on verb in obligatory condition (Yoshimura and Nakayama, 2010). Plural marker and inflection of verb in English are related to number features: realization of interpretable number features on noun and agreement between uninterpretable number features and interpretable features. On the other hand, Japanese does not have number features. In second language acquisition research, the

possibility that second language (L2) learners are able to acquire grammatical features which do not exist in their first language (L1) has been a subject of controversy. It is crucial to investigate the acquisition of number features by Japanese learners of English (JLEs).

This article reviews the previous studies on the acquisition of number features and is composed as follows: in chapter 2 the acquisition order of syntactic morphemes shows the difficulty of plural *-s* and third person *-s* for JLEs, in chapter 3 the two main hypotheses in acquisition of second language syntax are introduced, in chapter 4 I review the previous studies on the acquisition of number features, mainly on third person *-s* by JLEs and overall discussion and conclusion are in chapter 5.

2. Acquisition order

It has been assumed in L2 acquisition that the acquisition order of grammatical morphemes is universal and not effected by a learner's first language. Dulay and Burt (1974) examine whether their acquisition order differs between Spanish-speaking learners of English and Chinese-speaking learners and conclude that there exists a consistent acquisition order of grammatical morphemes. Krashen (1977), among



Figure 1. Proposed natural order for second language acquisition by Krashen (1977)

other subsequent studies, also suggests the “natural order” of morphemes in L2 acquisition.

Since then, it is often presumed that L2 learners of English follow the morphological development pattern. Some studies, however, reveal that the L1 influence on the acquisition order is stronger than has been supposed. Luk and Shirai (2009) review the studies on acquisition order of syntactic morphemes by Japanese learners of English and compare it with the natural order. The results indicate that plural *-s* is later than predicted by the natural order and third person singular *-s* is ranked somewhere in the last, compatible with the natural order. It means that it is more difficult for JLEs to acquire number-related grammatical morphemes than other morphemes.

3. Hypotheses in second language acquisition

As theoretical linguistics developed, from principle and parameter approach to minimalist program (Chomsky 1995, 2000), in L2 acquisition research, the acquisition of L2 syntax is rendered to the acquisition of grammatical categories and/or features of the target language. The most controversial issue is whether or not L2 learners can acquire the grammatical categories and/or features which do not exist in their L1. As for the variability of inflectional morphemes, the views are roughly divided into two realms: one attributes the variability to a kind of impairment existing in L2 syntactic knowledge of learners and the other argues that L2 learners have unimpaired syntax of the target language but they fail to produce or process L2 because of other factors such as communication pressure, the capacity of working memory or problems other than syntax.

3.1 Impairment hypothesis

Some researchers claim that L2 learners have impairment of functional categories and/or features in their L2 syntactic knowledge.

Hawkins and Chan (1997) conduct a grammaticality judgement task to investigate whether Chinese speakers can acquire restrictive relative clauses in English, in which the behavior of morphemes associated to functional category C (complementizer) differs from that in Chinese because the underlying features and their strength are different between English and Chinese. In the result, Chinese speakers cannot correctly decline the ungrammatical sentences. It leads the authors to conclude that L1 Chinese learners of English cannot

acquire the functional feature of C in English restrictive relative clause, which is not instantiated in their L1. Thus they hypothesize that L2 learners lack the functional features and/or feature strength which are inactive in their L1.

An examination concerning functional features on C is also conducted for JLEs by Hawkins and Hattori (2006). They investigate the acquisition of *wh*-movement in multiple *wh*-question by JLEs. A *wh*-word/phrase is required to move to the specifier of C in English because the uninterpretable feature [*uwh**] with C is strong. On the other hand, the feature [*uwh*] in Japanese is weak as the interrogative morpheme/phrase does not overtly move to the front. In a language which has strong uninterpretable *wh*-feature [*uwh**] like English, the interpretation of the multiple *wh*-question is constrained by Attract Closest Principle. Hawkins and Hattori examine the way that JLEs interpret bi-clausal multiple *wh*-question. The result shows the JLEs allow the interpretation that violates the Attract Closest Principle. The authors conclude that the JLEs fail to represent the feature strength of [*uwh**] in interrogative C, which gives rise to the effect of the Attract Closest Principle. They also argue that the possibility of acquisition of the uninterpretable features and/or feature strength in target language is determined by a learner's L1.

However, as for the agreement or inflection, the impairment hypothesis that L2 learners will never acquire the formal features which are not active in their L1 seems to be implausible.

White et al. (2004) investigate the acquisition of gender and number agreement in Spanish by L1 French (a language with grammatical gender and number) and L1 English (with number but not having gender) learners and find no significant difference in the performance on gender agreement between L1 French and L1 English learners. They suggest L2 learners have native-like syntax in relation to gender agreement even if their L1 does not have gender features. This does not support the impairment hypothesis.

3.2 Missing Surface Inflection hypothesis

Others argue that L2 learners can acquire abstract syntactic properties of language including functional categories and uninterpretable features and this explains the variability of inflection better.

Lardier (1998, 2000) provides the longitudinal production data of an L2 English learner, Patty, whose L1 is Mandarin

Chinese, which lacks tense marker on verb. The rate of production of third person singular *-s* and past tense *-ed* was quite low. The author, however, argues she in fact acquires the formal features given her performance on writing and almost perfect assignment of grammatical case to noun. Lardier has pointed out that the failure on phonological performance does not represent the deficit of underlying syntactic knowledge and that L2 learners have difficulty in mapping the morphological representations onto formal features.

This hypothesis has been supported by the following studies. Prévost and White (2000) collect the spontaneous production data from four children and four adults learning French and German. Two children are native speakers of English learning French and the two children learning German are Italian speakers. The two adult learners of French are speakers of Moroccan Arabic and the two adults learners of German are Portuguese and Spanish speakers respectively. The study analyzes occurrence of (in)finite verb forms in certain kinds of syntax structures which are related to the feature strength of I (a functional category for inflection). According to the result and their analysis, L2 learners produce non-finite (uninflected) forms both in finite and infinite position but finite forms are not seen in infinite position. They do not overgeneralize the inflected verb from regardless of their L1 backgrounds. The authors conclude that the L2 learners have functional categories and features but they use infinite form as a default from which has no value of person or number. They attributed the variability of verb form to missing surface inflection caused by a processing problem or communication pressure rather than impairment of features (Missing Surface Inflection Hypothesis, MSIH).

Ionin and Wexler (2002) also analyze the production data from L1 Russian children learning English. The rate of omission of third person singular *-s* with regular verb is 78% but no overgeneralization of *-s* is to be seen in their production. This observation is compatible with that by Prévost and White (2000). Moreover, they find the overgeneralization of *be*-verb and speculate that learners use *be*-verb to realize the functional features of tense and/or agreement. It implies that the L2 learners have native-like syntactic knowledge.

4. Studies on number features agreement by Japanese learners

4.1 Self-paced reading task

Wakabayashi (1997) conducts a grammatical judgement task and a self-paced reading task for JLEs to investigate their sensitivity to ungrammatical sentences. Four types of test sentences concern subject-verb agreement: Type 1 contains second person pronoun *you* in subject position and verb marked with third person singular *-s*. In type 2, two proper names, third person plural with a conjunction *and*, are located in subject position and verb is marked with *-s*. In type 3, subject is third person plural noun with plural marker *-s* and verb is marked with third person singular *-s*. Type 4 consists of third person singular subject and verb without inflectional morpheme *-s*.

- (1) a. Type 1 : *I hear that you *goes* to the pub, but I have never seen you there.
- b. Type 2 : *I think that Tom and Susan *likes* to go to the beach, so I will ask if I can go with them.
- c. Type 3 : *The teacher thinks the students *likes* discussions more than lectures, but this is not true.
- d. Type 4 : *I hear that Tom *go* to the pub every night, but I have never seen him there.

Subjects in the experiment are asked to read a sentence word-by-word on a computer screen with reading time for each word recorded (self-paced reading task) and after that, the whole sentence are displayed on the screen again with the question 'Is this English OK?' and they are to select an answer from five options; *yes*; *probably yes*; *maybe*; *probably no*; *no* (grammaticality judgement task). If the subject recognize ungrammaticality, the reading time of the word bringing about the ungrammaticality and a couple of words following it is longer than the counterpart in grammatical sentences and the subject should select '*no*' to the implausible sentence. As a result of the grammaticality judgement task, type 3 is the most difficult of the four and type 4 is the second most difficult, followed by type 2 and 1. In the self-paced reading task, JLEs with intermediate proficiency show their sensitivity to the ungrammaticality of type 1 but do not to type 2, 3 and 4. On the other hand,

highly proficient JLEs are sensitive to the type 1, 2 and 3 but not to type 4. The results indicate that JLEs are more sensitive to person feature than to number feature.

In addition, Shibuya and Wakabayashi (2008) examines that JLEs sensitivity to omission and overgeneralization of third person singular *-s* by self-paced reading task. They adopt the four types of sentences below.

- (2) a. Type A : *You eats a good meal for health every day.
- b. Type B : *Tim and Paul bakes an apple pie every Sunday.
- c. Type C : *The chefs cooks the shrimp in butter every time.
- d. Type D : *These two secretaries gets a cup of coffee for their boss every morning.
- e. Type E : *The child speak a lot of English during dinner.

Type A contains person feature disagreement and type B, C and D have number disagreement. In these 4 types, third person singular *-s* is overgeneralized on verb. Type E is tested to see the sensitivity to omission of inflectional morpheme. The ungrammaticality of type A,B and D elicit significantly longer reading time but type C and E do not.

4. 2 ERP study

The study using the event-related brain potential (ERP) technique, a neurophysiological method, has been conducted to examine JLEs (in)sensitivity to the subject-verb (dis)agreement.

Ojima et al. (2005) and Tatsuta (2014) test Japanese learners' ERP in response to the subject-verb agreement. In Ojima et al. (2005), the violation of agreement elicits both LAN¹⁾ and P600²⁾ in native speakers of English and LAN in high-proficient JLEs but neither P600 nor LAN are observed in the intermediate group. Tatsuta (2014) also reports the ERP pattern of high-proficient JLEs are similar to that of native speakers. They suggest that JLEs have the neural mechanism underlying the processing of subject-verb agreement in English like native speakers.

While these studies only use sentences with plural subject and overgeneralized *-s* in their experiment, shown in (3),

- (3) a. Turtles move/*moves slowly. (Ojima et al., 2005)
- b. Many boys like/*likes movies with action. (Tatsuta, 2014)
- c. Every evening, the little sisters help/*helps their mother. (Tatsuta, 2014)

Wakabayashi et al. (2007) adopt the four types of sentences in Wakabayashi (1997) to examine the ERP in response to person/number (dis)agreement and omission and overgeneralization of *-s*. As a result, P600 is observed in response to person disagreement or overgeneralization of *-s* on verb (e.g., *I answers your letter) but not observed in response to number disagreement (e.g., *The teachers answer our questions; *Sam and Adam answers our questions) and omission of *-s* (e.g., *My mother answer your question). This result is incompatible to the two previous ERP studies.

5. Discussion and conclusion

From the results of the previous studies on acquisition of third person singular *-s* by JLEs, they are sensitive to the overgeneralization of *-s* and not sensitive to the omission. This is compatible with the MSIH. JLEs differentiate inflected and uninflected verb and they often use the uninflected form as a default, which does not have specific value on number. However the insensitivity to the sentence “*the chefs cooks the shrimp in butter every time” (Type C in Shibuya and Wakabayashi, 2008) implies that JLEs fail to detect the number feature on the subject noun. In relation to this phenomenon, Yoshimura and Nakayama (2010) reported that omission of plural marker *-s* on noun remained longer than omission of third person *-s* in the production by JLEs. It also can be said that JLEs are more sensitive to person feature than number feature. However, MSIH does not give an adequate explanation for the difference between features. Further investigation is necessary to identify what factor causes the difficulty of producing and comprehending number features.

〈Notes〉

- 1) LAN (a later left anterior negative component) is elicited mainly in response to morphological violation and also reflects working memory.
- 2) P600 a late centro-parietal positive component is similarly elicited by morphological violation. It has been regarded as an indicator of re-processing.

〈Reference〉

- Chomsky, N. (1995) *The minimalist program*. Cambridge: MIT Press.
- Chomsky, N. (2000). Minimalist inquiries: The framework (MITOPL 15).
Step by step: Essays on minimalist syntax in honor of Howard Lasnik,
89-155.
- Dulay, H. C., & Burt, M. K. (1974). NATURAL SEQUENCES IN CHILD
SECOND LANGUAGE ACQUISITION 1. *Language learning*, 24(1),
37-53.
- Hawkins, R., & Chan, C. Y. H. (1997). The partial availability of Universal
Grammar in second language acquisition: The 'failed functional features
hypothesis'. *Second Language Research*, 13(3), 187-226.
- Hawkins, R., & Hattori, H. (2006). Interpretation of English multiple
wh-questions by Japanese speakers: A missing uninterpretable feature
account. *Second Language Research*, 22(3), 269-301.
- Ionin, T., & Wexler, K. (2002). Why is 'is' easier than '-s'? acquisition
of tense/agreement morphology by child second language learners of
English. *Second Language Research*, 18(2), 95-136.
- Krashen, S. (1977). Some issues relating to the monitor model. *Tesol*, 77
- Lardiere, D. (1998). Case and tense in the 'fossilized' steady state. *Second
language research*, 14(1), 1-26.
- Lardiere, D. (2000). Mapping features to forms in second language
acquisition. *Second language acquisition and linguistic theory*, 102-129.
- Luk, Z. P. S., & Shirai, Y. (2009). Is the acquisition order of grammatical
morphemes impervious to L1 knowledge? Evidence from the acquisition
of plural-s, articles, and possessive 's. *Language Learning*, 59(4), 721-754.
- Ojima, S., Nakata, H., & Kakigi, R. (2005). An ERP study of second
language learning after childhood: Effects of proficiency. *Journal of
cognitive neuroscience*, 17(8), 1212-1228.
- Prévost, P., & White, L. (2000). Missing surface inflection or impairment
in second language acquisition? Evidence from tense and agreement.
Second language research, 16(2), 103-133.
- Shibuya, M., & Wakabayashi, S. (2008). Why are L2 learners not always
sensitive to subject-verb agreement?. *Eurosla Yearbook*, 8(1), 235-258.
- Tatsuta, N. (2014) An event-related brain potential study of English
morphosyntactic processing in Japanese learners of English. Tokyo
Metropolitan University, Tokyo
- Wakabayashi, S. (1997) The acquisition of functional categories by
learners of English (Unpublished doctoral dissertation). University of
Cambridge, Cambridge, England.
- Wakabayashi, S., Fukuda, K., Bannai, M., and Asaoka, S. (2007). Japanese
speakers' sensitivity to third person singular-s in English: Arguments
based on ERP data. *Second Language*, 6, 19-46.
- White, L., Valenzuela, E., Kozłowska-Macgregor, M., & Leung, Y. K. I.
(2004). Gender and number agreement in nonnative Spanish. *Applied
psycholinguistics*, 25(1), 105-133.
- Yoshimura and Nakayama (2010) *Overseas short-term English
training and second language acquisition*. Tokyo, Hituzi-Syobo

(指導教員 齋藤兆史教授)