

L1 and L2 Acquisition Differences of Japanese Verb Inflections

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1. Introduction

Japanese has a rich inflectional morphology and learners as well as children need to acquire more than a dozen different inflectional endings in order to be able to use the language. A classic study, Nagano (1957) analyzed the data collected from his own children and reported that children's erroneous verb conjugation forms were derived in the process of systematic analogy. For example, **orosete* for *oroshite* (put me down) and **sasete* for *sashite* (put up an umbrella) were used as vowel-stem verbs rather than consonant-stem verbs, and **oroo* for *oriyoo* (let's get down) was used as a consonant-stem verb rather than a vowel-stem verb.

We encounter formal errors as well as usage errors of various verb morphemes made by L2 learners. Typical examples are seen in the te-form formation. The following two sentences are from Chinese learners' composition. The te-form of *sumu* (live) should be *sunde* instead of **sutte* and the te-form of *kuru* (come) should be *kite* instead of **kitte*.

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私は千種に住っています。

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日本に来て五年になります。

*Nihon ni *kitte go nen ni narimasu.* (It's been five years since I came to Japan.)

L2 learners need to form the *te*-form correctly and to use it properly because it is used for requesting, connecting sentences, and reasoning.

Unlike English, the Japanese verb inflectional system cannot be simply categorized as regular versus irregular, because it has several different regular verbs (there are *-iru* and *-eru* vowel-stem verbs and nine consonant-stem verbs such as *-(w)u* and *-ku*), and it also has two irregular verbs (*suru* and *kuru*).

In order to understand the differences between L1 and L2 concerning the acquisition of Japanese verb inflection, I will first review studies on Japanese morphology, focusing on the studies on *te*-form by Sakamoto (1993), Nagatomo (1997) and Komori and Shirai (2001). Then, I will review papers by Vance (1987 and 1991) and Klafehn (2001a and 2001b) which discuss L1 and L2 acquisition of Japanese verb inflectional system. Finally, I will examine the two existing language models: dual-processing model and analogical model.

2. Acquisition of Japanese morpheme *te*

As for the acquisition of Japanese verb forms, I will review the discussion of L1 and L2 studies. Examining acquisition processes of Japanese children and L2 learners, Kanagy (1991) and Clancy (1985) studied verb negation (*-nai*) and reported that both L1 children and L2

learners share similar acquisition process. Some studies, however, show the differences between L1 and L2. For example, Shirai and Komori (1998) reported that there were only two errors out of 686 forms with gerund *te*-form found in L1 child data from Miyata (1995),¹ whereas Sakamoto (1993) argued that L2 learners took a long period of time for acquiring *te*-form and they made many types of errors related to the form. Sakamoto conducted an elicitation experiment for *te*-form formation and examined the *te*-form acquisition order of all types of existing verbs. In this section, I will review studies of Sakamoto (1993), Nagatomo (1997) and Komori and Shirai (2001) on *te*-form acquisition order as an example of Japanese verb morpheme acquisition.

Sakamoto (1993) conducted a cross-sectional study of 82 native speakers of English studying Japanese as a second language. He used a written test in which learners were given both final (non-past) forms and *masu*-forms (formal form) of each verb and asked them to answer the corresponding *te*-form. He discovered that there were significant differences in errors for *te*-form formation among students of various proficiency levels of low intermediate, intermediate, low advanced and advanced, and proposed three stages of development for *te*-form formation: Stage I) *-su*, *-tu*, *-mu* and *-bu*; Stage II) *-iru*, *-eru*, *-(w)u* and *-ru*; Stage III) *-gu* and *-ku*. Since verb types of *-su*, *-tu*, *-mu* and *-bu* had the least errors for *te*-form formation, he concluded that these were the easiest types. Whereas verbs which were in *-gu* and *-ku* types had the most errors and they were considered the most difficult verb types.

Nagatomo (1997) conducted a six-month longitudinal study of nine participants who were also native speakers of English learning Japanese. He found that there were three stages of development for the *te*-form

¹ The two *-te* form errors found in the Miyata (1995) are **hakotte for hakonde* 'take' or 'bring', and **naotte for naoshite* 'repair' or 'fix'.

which were quite similar to the ones proposed by Sakamoto (1993). In Nagatomo's study, 35 verbs (both regular and irregular) were used to investigate the te-form formation both in written and spoken forms using the similar elicitation method to what Sakamoto had used. Nagatomo's data collection started immediately after the introduction of the te-form in class and continued once a month for six months. The three stages he found were Stage I) *-mu*, *-eru*, *-su*, *-tu*, *-bu* and *-iru*; Stage II) *-ru* and *-(w)u*; and Stage III) *-gu* and *-ku*. Nagatomo argued that his results supported Sakamoto's results. Nagatomo further explained the developmental sequence of the te-form formation in terms of the concept of phonological difficulties. He assumed that *-gu* and *-ku* verbs were the most difficult because the conjugation rules involved both vowel insertion and consonant deletion, whereas *-mu* and *-bu* were easier because the rule required only partial assimilation. His explanation is based on the concept of phonological markedness. First, partial assimilation rules are unmarked and their acquisition precedes that of marked complete assimilation rules, and secondly the vowel /i/ epenthesis (vowel insertion) rule is unmarked and its acquisition precedes that of the consonant /k/ and /g/ elision rules (Nagatomo 1997, p. 8).

Komori and Shirai (2001) conducted a four-month study of 30 instructed Japanese language learners of Chinese native speakers, replicating Nagatomo's (1997) study to see if the learners with a different L1 background would also have the same developmental sequences for the te-form. Komori and Shirai (2001) reported that their results were different from Nagatomo's. The average ratios of correct answers in their study were much higher than Nagatomo's ratios (see Table 1). They also found no distinctive verb cluster stages. Among three stages by Nagatomo, the scores of verbs which had been categorized in the second group (*-ru* and *-(w)u*) and the third (*-gu* and *-ku*) were higher than some

of those in the first group (*sinu*, *iku* and *-iru*) in Komori and Shirai's study. However, as for the verb *sinu*, the scores in Komori and Shirai's study was much lower (51.1%) than those in Nagatomo's study (75.9%).

Table I Comparison of Nagatomo (1997) and Komori and Shirai (2001)

Nakatomo's order	Verb type	Nakatomo's ratio of correct (%)	Three stages by Nagatomo	Komori and Shirai's ratio (%)	Komori and Shirai's order
1	<i>-mu</i>	84.6	I	95.9	5
2	<i>-eru</i>	83.3		95.7	6
3	<i>suru</i>	83.3		100	1
4	<i>kuru</i>	79.6		98.5	2
5	<i>-su</i>	79.6		97.0	3
6	<i>-tu</i>	76.5		96.5	4
7	<i>-bu</i>	75.9		94.4	9
8	<i>sinu</i>	75.9		51.1	14
9	<i>iku</i>	74.1		83.1	11
10	<i>-iru</i>	72.8		73.3	13
11	<i>-ru</i>	63.6	II	94.9	8
12	<i>-(w)u</i>	63.6		95.6	7
13	<i>-gu</i>	55.6	III	81.7	12
14	<i>-ku</i>	50.6		92.4	10

Komori and Shirai (2001) argued that their results of *-bu* and *-iru* violated Nagatomo's explanation of partial assimilation rules. The conjugation rule of te-form formation of verb types *-mu* and *-bu* involves partial assimilation. The rule of *-iru* does not require any assimilation.. They claimed that the errors relating to *-ru* and *-iru* verbs were mainly due to the confusion of consonant-stem verbs *-ru* type and vowel-stem verbs *-iru* type, and the confusion of distinguishing the two may be one of the reasons why learners produced more incorrect forms.

Sakamoto (1993), Nagatomo (1997) and Komori and Shirai (2001) tried to discover the acquisition sequence of te-form. The result of Nagatomo's (1997) experiment confirms the te-form acquisition sequence Sakamoto (1993) proposed, and Nagatomo (1997) tried to explain the sequence in terms of the concept of phonological markedness which has been widely acknowledged as a universal principle of many languages. Komori and Shirai's (2001) study with different L1 background learners, however, did not coincide with the results of Sakamoto (1993) and Nagatomo (1997), which means that Nagatomo's (1997) explanation is not valid. Nagatomo's (1997) explanation was based on the phonological markedness of the target language. He did not take the learners into consideration. In the study of SLA, we also need to pay attention to not only the learners' learning processes but also learners' L1 background.

3. Studies by Vance (1987 and 1991) and Klafehn (2001 a and 2001 b)

Klafehn (2001a and 2001b) discussed the acquisition of Japanese verb morphemes using the analogical model. Klafehn (2001a) conducted his experimental study using instructed L2 learners by replicating Vance (1987 and 1991). Klafehn (2001b) examined Japanese children's data and raised questions about segmentation and regularity. In this section, I will first review two papers by Vance (1987 and 1991) and then discuss the two papers by Klafehn (2001a and 2001b).

Vance (1987) examined the conjugation of made-up verbs by the Japanese native speakers in an experimental study (pp. 199-208). He designed the study to examine a Japanese linguist's claim that Japanese speakers were able to correctly conjugate verbs they have never heard

before based on the knowledge of the verb forms they know. He used four made-up verbs (*homu*, *hoku*, *yonu* and *kapu*). Non-past form of each made-up verb was written on a sheet and the subjects were asked to write down conditional, volitional, desiderative and past forms for each verb. He reported that only 51% (380 out of 750) responses were correct and concluded that ordinary Japanese native speakers had a great difficulty in conjugating the made-up verbs they had never heard of.

In Vance (1991), he revised his previous experiment (Vance 1987). He used both consonant-stem verbs and vowel-stem verbs, and gave volitional form as well as non-past form as a clue to conjugate the verbs. Vance (1991) used four made-up verbs with 75 native speakers of Japanese. Theoretically, the subjects could have conjugated the made-up verbs based on the information of two forms given as clues, if they had known the rules. The results, however, were surprising. Only 63% of the Japanese native speakers could choose the analogically correct forms of the four made-up verbs. Vance (1991), therefore, concluded that the Japanese native speakers did not know the verb conjugation rules. This study seems to suggest that the Japanese native speakers use rote memory rather than rules to conjugate Japanese verbs.

Concerning the differences between L1 and L2, Klafehn's (2001a) Japanese verbal morphology study replicated Vance's (1991) made-up verb experiment with 50 instructed learners of Japanese as a foreign language. He found that the learners tended to choose paradigmatically consistent inflected made-up forms (74%) compared to the results of the native speakers in Vance (1991). He argued that this result problematized the dual-system model for verbal processing (Pinker 1999, and Pinker and Prince 1994) which claims that the inflection of made-up forms was determined by default regularization. The dual-processing model presupposes segmentation of stem and suffix for conjugating verbs. However,

as Klafehn (2001a) pointed out, segmentation of Japanese verbs is not straightforward. The inflectional endings of Japanese verbs are vowels at the end of the verb forms. When written, however, an inflectional suffix vowel and the preceding consonant, which is the last phoneme of the stem of the verb, constitute one kana character. In other words, the last phoneme of the stem and the inflectional ending constitute one kana character, and so it is actually impossible to segment the stem and the inflectional suffix for consonant verbs. Native speakers of Japanese who haven't studied Japanese linguistics do not know this and have difficulty in segmentation.

Klafehn (2001a) concluded that native speakers stored fully inflected verbal forms in memory and did not make use of rules, whereas non-native speakers, who had been exposed to the use of inflectional rules either through explicit instruction or heuristic discovery, relied heavily on analogy-based strategies in conjugating verbal forms in the made-up verb test.

In order to see how Japanese L1 children acquire verb inflectional system, Klafehn (2001b) investigated the L1 child acquisition data of Miyata (1992, 1995, and 2000). He found no canonical errors but a variety of errors for the same types of verbs.

In English, the blocking principle (Pinker and Prince 1994) predicts that when an irregular past form (e. g. *went*) is retrieved from memory, the application of the regular rule (e. g. adding *-ed*) is blocked. If an irregular form is not stored in memory, then the regular rule is applied to produce the form ("overgeneralization"), which means the produced errors should be regular based on the rule. In the case of Japanese L1 data, Klafehn (2001b) found no canonical inflectional errors. Therefore, Klafehn (2001b) concluded that the Japanese language did not have canonical verbal inflectional rules.

As we have seen, Klafehn (2001a) found that instructed L2 learners tended to choose more paradigmatically consistent forms than native speakers for the made-up form recognition test. From the two studies by Klafehn, both Japanese adults and children may not use inflectional rules, but they use analogy. Instructed learners may be more rule-governed due to their rule-based grammar instruction.

4. Two models of language processing

In this section, I will review psycholinguistic papers discussing language processing models. First, Marcus, Pinker, Ullman, Hollander, Rosen and Xu (1992) examined children's feature of overregularizations of English irregular verbs. They analyzed 11,521 irregular past tense utterances in the spontaneous speech of 83 children from the CHILDES database. This overregularization of errors was relatively rare. They claimed that overregularization occurred when a child started to use regular past-tense marking rules.

Pinker and Prince (1994), studying multidisciplinary studies including Marcus et al. (1992), argued that regular and irregular inflections must be computed by two different systems. They called this a dual-processing model. This model claims that regular inflections are generated by rules, while irregular ones are stored in memory. As for the interaction of the two systems, Pinker and Prince (1994) proposed a blocking principle. Retrieval of an irregular form blocks the rule, but children's memory traces are not strong enough to guarantee perfect retrieval. When retrieval fails, nothing blocks the rule, and overregularization results" (p. 344).

Pinker (1999) further discussed the same topic of rule and rote as

Pinker and Prince (1994), dealing with different aspects of regular and irregular word forms. First, he compared two theories: Generative Phonology and Parallel Distributed Processing (PDP). Generative Phonology claims rule governance, and both regular and irregular past-tense forms are considered to be governed by rules. PDP, on the other hand, rejects rules, and claims that people store associations between the sounds of stems and sounds of past-tense forms and generalize the associations of new words.

Pinker (1999) argues that each theory per se was not appropriate to explain how people generate regular and irregular forms. He proposed the words-and-rules theory, claiming that regular verbs were computed by rules and irregular verbs were retrieved from the mental lexicon. Marcus et al. (1992), Pinker and Prince (1994) and Pinker (1999), therefore, seem to agree on the dual-processing model which uses both memory and rules.

Stemberger and MacWhinney (1988) discussed the issue of whether inflected forms were stored in the mental lexicon or not, focusing on the English past-tense regular and irregular verb inflections. They examined the issue from a psycholinguistic perspective, using naturally occurring error data of adult native speakers of English. They used frequency values per million words derived from Francis and Kucera (1982) and studied regular and irregular verb groups. Comparing high-frequency groups and low-frequency groups of both regular and irregular verbs, they concluded that both high-frequency irregular inflected forms and high-frequency regular inflected forms were stored in the lexicon, but low-frequency regular inflected forms which include the inflected forms of most English words, were not stored in the lexicon. In other words, this seems to give supporting evidence for the dual-processing model, which supposes that different processing mechanisms are working for the regular (rule) and the irregular (memory).

However, a number of scholars do not agree about the validity of the dual-processing model. For example, Bybee (1995), Stemberger (1994), Chandler (1993), Skousen (1989), Tomasello (2000), and Shirai (2002) argued against the dual-processing model and gave alternative models. First, Bybee (1995) argued that the dual-processing model which consisted of a lexical schema and a symbolic rule was not what child acquisition data suggested. According to Bybee (1995), Marcus et al. (1992) examining child data, concluded that the model contained a lexical schema strategy for irregular verbs and a symbolic rule application for regular verbs, but Marcus et al. (1992) did not show how the symbolic rule was acquired. He argued that if the dual-processing model existed, there should be a sign of switching where children restructure from the lexical schema to the symbolic rule. Marcus et al. (1992), however, failed to show it in the child data. Bybee (1995) proposed an alternative model which was called network model which requires only one way of processing for both regular and irregular verbs. Bybee (1995) assumed that the network model was represented in a lexical schema. Although the dual-processing model claims that two highly distinct types of processing are involved in dealing with regular versus irregular inflections, the distinction between regular and irregular inflections is a structural difference which is independent of the type frequency of the morphological patterns. Bybee (1995), therefore, denied the blocking principle. The network model claims that the actual usage of forms in terms of both type and token frequency plays an important role in establishing and maintaining representations. Using German and Arabic data he demonstrated that type frequency determined regularity. For example, he examined the type frequency of German plurals and showed that the productivity patterns of German plurals reflected its type frequency (p. 426).

McClelland and Patterson (2002) also opposed the dual-processing

model by giving evidence from analyzing child language data. They found that the acquisition of the regular past tense was not sudden but gradual. Children in their study gradually acquired the target until the age of three. They also suggested a single network model which arose within the Parallel Distribution Processing (PDP) or connectionist framework. They argued that the network was inherently programmed to process regular forms as well as irregular forms in the same way. For example, in order to get *kept* instead of *keeped*, the network will learn to adjust the vowel on the basis of experience *keep* and its neighbors *creep*, *leap*, *sleep* and *weep*. In other words, the connectionist model finds partial regularity for irregular forms.

Stemberger (1994) proposed a rule-less model, an alternative to rule-based models, which assumed that all words were stored in the lexicon and networked with each other in meaning and phonology. According to this model, when the semantic unit of past-tense, for example, is activated, all past tense forms are activated to some degree. This activation among items which have shared characteristics is called “gangs”. There are phonological gangs and also lexical gangs. Stemberger (1994) claimed that the system would choose gangs to activate depending on its environments.

Chandler (1993) pointed out that the representational overlap of irregular family resemblances (such as *sing/sang/sung*) form a mental subcategorization. He criticized Pinker for his focusing only on a structural description of rule formation. He argued that people processed regular or irregular verb morphemes with its meanings. As an alternative to the dual-processing model, Chandler adopted an analogical approach which Skousen (1989) developed. In this approach, “the algorithm compares the current input with specific experiences stored in memory. The algorithm compares contextualized memories, evaluates their similarity

to the new experience, and chooses *one* as the basis for interpreting the new experience analogically” (Chandler 1993, p. 603).

Analyzing children’s spontaneous speech and experimental data, Tomasello (2000) argued “there is no evidence of any system-wide syntactic categories, schemas, or parameters” because “most of children’s early linguistic competence is item based, and proposes usage-based theory of child language acquisition” (p. 209). From the analysis of his child’s diary data between 15 to 24 months of age, he showed evidence that of the 162 verbs and predicate terms used, almost half were used in one and only one construction type, and over two-thirds were used in either one or two construction types (Tomasello 1992). Therefore, Tomasello set up the Verb Island Hypothesis which claiming that children’s early language is organized and structured around individual verbs without linguistic abstractions.

Shirai (2002) discussed the acquisition of verb tense and aspect. According to his study of English verb morphological acquisition, children started using the bear form without inflection, and gradually began to use inflected forms such as past tense. When children began to use the past tense form, it was only with a limited verb class, exclusively with achievement verbs. They often fail to put past tense marking with various verbs but do not overgeneralize the past tense marking when it is unnecessary (Shirai and Andersen 1995).

Both Tomasello (2000) and Shirai (2002) seem to oppose the dual-processing model and support the gradual acquisition process of child language. An alternative analogical or connectionist view of language processing is supported by Japanese language learning data as discussed by Klafehn (2001b).

As I have examined in this section, two different models are proposed for language processing. As Klafehn points, the dual-processing model

seems to fail to explain the reason why learners are more consistent in the choice of Japanese verb inflection forms than native speakers in a made-up verb test. The analogical or single-processing model seems more appropriate for explaining the acquisition of Japanese verb inflections for both native speakers and learners.

5. Conclusion

At the beginning of this paper, I pointed out that L2 learners make many errors for the te-form conjugation compared with L1 children. In order to understand in what way the acquisitions of Japanese verb morphemes between L1 and L2 differ, I have first examined a series of studies on acquisition sequences of Japanese verb morpheme *te*. Then, I have reviewed the discussions by Vance (1987 and 1991) and Klafehn (2001a and 2001b) for the differences between L1 and L2 verb inflectional systems in terms of acquisition. Finally, I explored a theoretical discussion between two models of language acquisition in this respect.

The aim of studies by Sakamoto (1993), Nagatomo (1997) and Komori and Shirai (2001) was to discover the acquisition sequence of the te-form. The te-form acquisition sequence Sakamoto (1993) proposed was assured by the result of Nagatomo's (1997) experiment using learners with English L1 background. Nagatomo (1997) tried to explain the sequence in terms of the concept of phonological markedness. Komori and Shirai's (2001) study with different L1 (Chinese) background learners, however, did not coincide with the results of Sakamoto (1993) and Nagatomo (1997). This discrepancy cannot be explained by Nagatomo's (1997) idea of phonological markedness. The idea of phonological markedness has been accepted as a universal principle of

many languages and his analysis is based on the analysis of the target language. However, Nagatomo's (1997) explanation did not take the learners' L1 into consideration. In the study of SLA, we should pay more attention to the learners' learning processes.

Second, as for the discussion of L1 and L2 acquisition of Japanese verb inflections, Vance (1987 and 1991) and Klafehn (2001a) reported their experimental studies using made-up verb form recognition tests. Vance (1987 and 1991) studied Japanese native speakers and concluded that they did not know the verb conjugation rules. Two of his studies seem to suggest that the Japanese native speakers use rote memory rather than rules to conjugate Japanese verbs. Klafehn (2001a) examined JSL learners, replicating Vance's (1991) study and found that instructed L2 learners tended to choose more paradigmatically consistent forms than native speakers. Klafehn (2001b) examined L1 child data and found that L1 children do not make canonical inflectional errors. From the studies by Vance (1987 and 1991) and Klafehn (2001a and 2001b), it can be concluded that both Japanese adults and children do not use inflectional rules but analogy. Instructed learners are more rule-governed due to their rule-based grammar instructions.

Finally, I have examined the two different models proposed for language processing, a dual-processing model and an analogical or connectionist model. Marcus et al. (1992), Pinker and Prince (1994), Pinker (1994), and Stemberger and MacWhinney (1988) argued that regular verbs were computed by rules and irregular verbs were memorized (dual-processing). Bybee (1995), Stemberger (1994), Chandler (1993), Skousen (1989), Tomasello (2000) and Shirai (2002) argued against the dual-processing model and claimed an alternative analogical model of language processing. As Klafehn pointed out, the dual-processing model seems to fail to explain the reason why learners are more consistent in

their choice of Japanese verb inflection forms than native speakers in a made-up verb test. The analogical or single-processing model seems more appropriate to explain the acquisition of Japanese verb inflections for both native speakers and learners.

Through the discussion in this paper, the following points can be concluded :

- 1) The L1 acquisition of Japanese verb morphemes use analogy (an analogical model), and so Japanese L1 children make a small number of inconsistent errors. It is small since L1 children use only verbs they have learned (Tomasello's Verb Island Hypothesis). It is inconsistent since L1 children do not use rules. Even adult Japanese native speakers do not use rules.
- 2) The L2 acquisition of Japanese verb morphology is affected by the learners' L1 backgrounds.
- 3) L2 learners tend to use rules they have learned in class, and so they make many consistent errors.

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