

**RULE VERSUS ANALOGY  
IN DERIVATIONAL MORPHOLOGY:  
THE CASE OF AGENT NOUNS IN JAPANESE AND ENGLISH**

**Reiko Shimamura**

*Tsuda College, Tokyo*

**Abstract:** The aim of this paper is to consider whether the clear distinction between regulars and irregulars in inflectional morphology, claimed by Pinker (1991) and others, applies to derivational morphology as well. The main concern here is with agent nouns in Japanese and English. In Shimamura (1997) I proposed that in English the agentive suffix *-er* has the default status, but that in Japanese, there is no agentive suffix acting as the default, and furthermore claimed that Japanese agent nouns with a suffix, when newly produced, are obtained by analogy with existing words, not by rule. In the present paper, this claim will be confirmed by three experiments I conducted.

**Keywords:** agent noun, agentive affix, analogy, default, derivational morphology, mental lexicon, productivity

## 1. INTRODUCTION

The processing and acquisition of regular and irregular inflectional morphology, especially with respect to the past tense forms of English verbs, have recently been a topic of incessant disputes between Pinker and others (Pinker, 1991; Pinker and Prince, 1991; Prasada and Pinker, 1993) on the one hand and connectionists and linguists like Bybee (1991, 1995) on the other. They disagree as to whether regular and irregular forms should be considered to be

computed by different mechanisms or not. The former, in contrast to the latter, propose that regulars and irregulars are qualitatively different from each other. According to them, past tense forms of irregular verbs and their base forms are both stored in the mental lexicon, but the paired members are linked with each other in an associative memory structure, with certain connectionist-like properties. Therefore, it sometimes happens that *brang*, instead of *brought*, is produced as the past tense form of the irregular verb *bring* due to an analogical extension of the existing pattern of *drink/ drank, sink/ sank, spring/ sprang*, and so on.

On the other hand, past tense forms of regular verbs are generated by a symbolic rule of the grammar that combines the suffix *-ed* with the symbol Verb representing the category of verbs. This symbol-processing operation is unaffected by frequency and similarity, and can apply as the default to any verb without accessing stored verbs or their sound patterns in the lexicon. It, therefore, is possible that the rule will apply even to novel verbs such as *ploamph* which do not sound like existing verbs, to generate past tense forms like *ploamphed*.

It is argued by some linguists like Marcus et al. (1995) that German plural inflections also provide us with strong evidence for the distinction between regulars and irregulars because the suffix *-s* behaves as the default despite its lowest frequency, though I do not explain this any further in this paper.

A lot of research has so far been concerned with the issue of rule versus lexical memory. However, this issue has been chiefly limited to inflectional morphology, and Pinker and Prince (1991: 239) leave the issue unsettled because of the capricious productivity of much of English derivational morphology.

This paper aims to consider whether the clear distinction between regulars and irregulars in inflectional morphology, claimed by Pinker (1991) and Pinker and Prince (1991), applies to derivational morphology as well.

## 2. RULE VERSUS ANALOGY IN DERIVATIONAL MORPHOLOGY

Ito et al. (1996) is, as far as I know, the only serious attempt to apply the claim of rule and analogy distinction by Pinker and his colleagues to derivational morphology. Ito et al. (1996) contrast the two Japanese nominalization suffixes *-sa* and *-mi*, both of which attach to adjective roots to form nominals. For example, with the adjective *taka-i* 'high', both *taka-sa* and *taka-mi* are possible, but with the adjective *chiisa-i* 'small', only *-sa* forms are acceptable. Considering high degree of productivity of the suffix *-sa*, Ito et al. (1996) conclude that *-sa* nominals and *-mi* nominals are processed differently from each other; the former are claimed to be computed by a default rule, while the latter are stored in an associative memory system

and can be extended to new forms by analogy.

This conclusion is strengthened by two experiments they conducted. One of the results of the first experiment was that novel words derived by *mi*-suffixation were sensitive to their phonological similarity to existing words, while *sa*-suffixation leads to novel words regardless of phonological similarity. This is illustrated by the two novel adjectives *mako-i* and *katoN-i*; the former sounds like existing words, but the latter does not, with the root ending in /N/. In the case of the suffix *-mi*, it was more difficult to attach this suffix to the latter type of novel adjective than to the former, while there was no significant difference in acceptability between the two types of novel nominal with the suffix *-sa*.

I pointed out in Shimamura (1995) that some morphological and semantic parallels exist between *-ness* and *-ity* in English on the one hand and *-sa* and *-mi* in Japanese on the other. I proposed therefore that *-ness* and *-sa* both behave as the default suffix which forms nominals from adjectives. However, I indicated in Shimamura (1997) that in the case of agent nouns, Japanese, unlike English, has no word formation process which acts as the default.

### 3. AGENT NOUN FORMATION IN ENGLISH

English has agentive suffixes such as those listed in (1) which can attach to verbs, and *-er* is the most productive, and is considered to act as the default.

(1) *-er* (driver), *-ant* (participant), *-y* (guide), *-ist* (conformist)

The default status of the suffix *-er* seems to be confirmed by its use in novel or nonsense words like the one in (2), and also by so-called 'blocking' phenomena, illustrated by (3).

(2) *zibber* (Berko 1958: 52)  
 (3) \**inhabiter* vs. *inhabitant*

If it is proved through experimentation that this suffix can also attach to unusual-sounding verbs like *ploamph*, given in Section 1, to derive *ploampher*, the claim will be further supported that *-er* suffixation is a default rule.

### 4. AGENT NOUN FORMATION IN JAPANESE

I will claim that in contrast to English, Japanese has no word formation rule for agent nouns which acts as the default. Before dealing with agent nouns in Japanese, I will show very briefly that part of backward knowledge of Japanese which is necessary to discuss agent noun formation in Japanese.

#### 4.1 Backward knowledge

There are two different categories both of which have the categorial feature [+V] in Japanese, that is, Verb and Verbal Noun. The former consists of [+V] and [-N], while the latter consists of [+V] and [+N], functioning both as a noun when used alone and as a verb when followed by the light verb *suru*, which means 'do'.

There are three morpheme classes in Japanese: Native, usually called Yamato, Sino-Japanese, and Foreign. Verbs generally belong to Yamato, while many verbal nouns belong to Sino-Japanese, some to Yamato, and others to Foreign.

Lastly, I will mention in brief that part of the writing system of Japanese which is relevant to the discussion in this paper. Chinese characters are called *kanji*, and each morpheme in a Sino-Japanese word is written with a single *kanji*. In many cases, *kanji* have come to be used also for Yamato (Native) morphemes with similar meanings. For example, the same *kanji* can be used for both the Sino-Japanese morpheme *tei* 'garden' and the Yamato word *niwa* 'garden'.

#### 4.2 Agentive suffixes and their bases

Now let us pay attention to agentive suffixes in Japanese. There are at least 13 different agentive suffixes in Japanese which can attach to verbal elements, that is, verbs and verbal nouns bearing the feature [+V]. These are listed in Table 1 below, which is a partial reproduction of the table shown in Shimamura (1997). The table indicates for each of the agentive suffixes numbered 1 to 13 (i) its composition(s), (ii) the number of words with these compositions listed in the *Kojien*, one of the authoritative Japanese-dictionaries currently available, and (iii) an example representing each composition. The figures in the two columns furthest to the right respectively show, for each suffix, (iv) the number of suffixed words with the Yamato base which are listed in the *Kojien*, and (v) the number of suffixed words with the Sino-Japanese base which are listed in the same dictionary.

In the case of Japanese, the distinction between derivatives and compounds are more difficult to make than in English. But I assume here that all the morphemes in Table 1 are affixes, without arguing. For some of the Sino-Japanese and Yamato agentive suffixes listed in Table 1 below, the same *kanjis* are used, and such suffixes are similar in meaning. For example, the suffix numbered 3 and the one numbered 12, to which the same *kanji* can be assigned, both mean 'hand' literally. The rough generalization which can be drawn from the table seems to be the following:

(4) Yamato agentive suffixes usually attach to Yamato bases, and Sino-Japanese agentive suffixes to Sino-Japanese bases.

But the above is considered merely to be a tendency, as is clear from, for instance, the agentive suffix numbered 8, which belongs to Sino-Japanese but nonetheless can attach to Yamato bases in some cases.

I indicated in Shimamura (1997) that the most productive agentive suffixes in Japanese are *-te*, *-nin* and *-sha*, which are boldfaced in Table 1, but that none of them can act as the default. In that paper I also claimed that this fact leads us to assume that the linkages between the paired verbs or verbal nouns and the corresponding agent nouns are stored in associative memory, and that such linkages will license productive extensions to new agent nouns by analogy with existing ones.

Table 1 Agentive suffixes and their bases in Japanese

Agentive Suffixes	Compositions	Number of words listed in the <i>Kojien</i>	Examples	Number of Words with a Yamato base listed in the <i>Kojien</i>	Number of Words with a Sino-Japanese base listed in the <i>Kojien</i>
1. <i>-mono</i> (lit. Person)	[V +]mono	63	<i>abare-mono</i> (act violently-person) • @ 'rowdy'	66	4
	[s-jVN +]mono <sup>a</sup>	4	(omitted)		
	[y VN +]mono <sup>b</sup>	3	(omitted)		
2. <i>-nushi</i> (lit. Owner)	[V +]nushi	14	<i>uri-nushi</i> (sell-owner) 'seller'	14	0
3. <i>-te</i> (lit. Hand)	[V +]te	74	<i>yomi-te</i> (read-hand) 'reader'	74	0
4. <i>-ya</i> (lit. House; person)	[V +]ya	29	<i>togi-ya</i> (whet-house) 'whetter'	30	8
	[s-jVN +]ya	8	<i>koukoku-ya</i> (advertise-house) 'advertiser'		
	[y VN +]ya	1	(omitted)		
5. <i>-in</i> (lit. Member)	[V +]in	3	<i>nori-kumi-in</i> (board-join-member) 'crew'	3	13
	[s-jVN +]in	13	<i>juugyou-in</i> (work-member) 'worker'		
6. <i>-ka</i> (lit. Expert)	[V +]ka	1	(omitted)	1	13
	[s-jVN +]ka	13	<i>hihyou-ka</i> (criticize-expert) 'critic'		
7. <i>-kan</i> (lit. Government officer)	[V +]kan	1	(omitted)	1	13
	[s-jVN +]kan	13	<i>shiki-kan</i> (command-government officer) 'commander'		
8. <i>-nin</i> (lit. person)	[V +]nin	17	<i>uke-tori-nin</i> (receive-obtain-person) 'recipient'	21	53
	[s-jVN +]nin	53	<i>unsou-nin</i> (carry-person) 'carrier'		
	[y VN +]nin	4	<i>shita-uke-nin</i> (sub-contract-person) 'subcontractor'		
9. <i>-sha</i> (lit. person)	[V +]sha	3	(omitted)	3	35
	[s-jVN +]sha	35	<i>shouhi-sha</i> (consume-person) 'consumer'		
10. <i>-shi<sub>1</sub></i>	[V +]shi <sub>1</sub>	13	<i>nui-shi</i> (sew-master) 'sewer'		

Agentive Suffixes	Compositions	Number of words listed in the <i>Kojien</i>	Examples	Number of Words with a Yamato base listed in the <i>Kojien</i>	Number of Words with a Sino-Japanese base listed in the <i>Kojien</i>
(lit. master)	[s- <i>jVN</i> +] <i>shi</i> <sub>1</sub>	18	<i>chouri-shi</i> (cook-master) 'licensed cook'	14	18
	[ <i>yVN</i> +] <i>shi</i> <sub>1</sub>	1	(omitted)		
11. - <i>shi</i> <sub>2</sub> (lit. qualified person)	[s- <i>jVN</i> +] <i>shi</i> <sub>2</sub>	12	<i>soujuu-shi</i> (pilot-qualified person) 'pilot'	0	12
12. - <i>shu</i> (lit. hand)	[s- <i>jVN</i> +] <i>shu</i>	3	<i>unten-shu</i> (drive-hand) 'driver'	0	13
13. - $\phi$	[V +] $\phi$	?	<i>suri-<math>\phi</math></i> (lift-person) 'pickpocket'		
	[s- <i>jVN</i> +] $\phi$	?	<i>kantoku-<math>\phi</math></i> (manage-person) 'manager'	?	?
	[ <i>yVN</i> +] $\phi$	?	<i>uketsuke-<math>\phi</math></i> (receive-attach-person) 'receptionist'		

<sup>a</sup> *s-jVN*=Sino-Japanese Verbal Noun

<sup>b</sup> *yVN*=Yamato Verbal Noun

#### 4.3 Agentive suffix -te

In this paper I will restrict myself to the suffix *-te*, and will propose that the above-mentioned assumption is supported by the fact that novel agent nouns with this suffix seem to be acceptable only when they are formed from verbs which sound like existing ones, and also by the fact that it can in most cases attach only to simple verbs, but not to compound verbs. The three experiments I performed which are shown in Section 7 will well attest these two facts.

According to Table 1, there are as many as 74 words with the suffix *-te* which are entered in the *Kojien*. This fact certainly demonstrates that it is a very productive suffix. On the other hand, there are 14 words with the suffix *-nushi* which are listed in the same dictionary, fewer than the words with the suffix *-te*. Later in Section 7, I will show the results of the first experiment that was done to compare agent nouns with the suffix *-te* and those with the suffix *-nushi* with respect to the degree of productivity. (I do not consider that the two agentive suffixes *-mono* and *-ya* are productive in spite of the fact that the *Kojien* lists many words with each of these suffixes, as is obvious from Table 1. For details, see (Shimamura, 1997).

High productivity of the suffix *-te* is also evidenced by coinages. Ease of lexical innovations, rather than frequencies in established words listed in a dictionary, is a more reliable criterion for measuring productivity, as is claimed by Clark (1993). I find agent nouns with this suffix given in (5) all acceptable, though none of them are listed in the *Kojien*.

(5) *nomi-te* 'drinker', *seme-te* 'attacker', *harai-te* 'person who  
pays', *nage-te* 'thrower', *hakobi-te* 'carrier', *hiroi-te* 'picker',  
*migaki-te* 'polisher', *yatoi-te* 'employer'

However, note here that the suffix *-te* cannot act as the default, in contrast to the English agentive suffix *-er*, as is clear from the fact that the agent nouns with this suffix given in (6)

are not considered to be completely productive.

(6) ??*yaburi-te* (break-*te*) 'breaker', ??*sake-te* (avoid-*te*) 'avoider',  
 ??*nobori-te* (climb-*te*) 'climber', ??*manabi-te* (learn-*te*) 'learner',  
 ??*nemuri-te* (sleep-*te*) 'sleeper'

What should be noticed here is that in accord with the generalization given in (4) above, the suffix *-te*, which is of the Yamato morpheme class, attaches to verbs, which are also essentially of the Yamato morpheme class except for some slang words or vogue words like *bibir-u* 'shrink'.

## 5. MORPHEME CLASSES AND THEIR PHONOLOGICAL BEHAVIOR

What is crucial in distinguishing the Yamato morpheme class from the Sino-Japanese or the Foreign morpheme class? Various phonological constraints closely linked to the morpheme class distinctions have been proposed by many researchers. In fact, some linguists such as Vance (1987) and ItÙ and Mester (1995) claim that the classification of the morpheme classes is motivated by their phonological properties, which can be accounted for by some types of phonological constraints, which are illustrated by the constraints (a) - (e) below.

(7) Phonological constraints relevant to the morpheme classes

Morpheme classes	Yamato	Sino-Japanese	Foreign
<b>Constraints</b>			
a. constraint allowing only a single voiced obstruent per morpheme	<i>f-</i> <i>huta</i> 'lid' <i>*buda</i>	*	*
b. constraint ruling out a voiced obstruent geminate like *bb, *dd, *gg, and *zz	<i>f-</i> <i>asatte</i> 'the day after tomorrow'	<i>f-</i> <i>sippai</i> 'failure'	<i>beddo</i> 'bed'
c. constraint against a single <i>/p/</i>	<i>f-</i> <i>nippon</i> 'Japan'	<i>f-</i> <i>kanpai</i> 'cheers'	<i>peepaa</i> 'paper'
d. constraint against an initial liquid	<i>f-</i> <i>simeru</i> 'close' <i>*rimeru</i>	*	<i>rrei</i> 'relay'
e. sounds specific to Foreign words, like [tso] and [fa]	*	*	<i>f-</i> <i>faito</i> 'fight'

The constraint (a) allows only a single voiced obstruent per morpheme and must be followed

by the Yamato morpheme class; for example, *huta* 'lid' is possible but *\*buda* is not as a Yamato word. The constraints (b) and (c) must be obeyed by the Yamato and Sino-Japanese morpheme classes. The constraint (d), like the constraint (a), holds only for the Yamato morpheme class. The constraint (e) specifies that sounds like [tso] and [fa] are used only in Foreign words. Therefore, in principle, neither words of the Yamato morpheme class nor of the Sino-Japanaeze morpheme class contain such sound sequences.

## 6. AGENT NOUNS WITH -TE AS ANALOGICAL EXTENSIONS

### 6.1 Phonological similarity of -te novel words to existing Yamato words

Given the proposal that *-te* is restricted to bases of the Yamato morpheme class, it is predicted that it can attach freely to novel verbs which sound like existing verbs, but that it is rather difficult for the suffix to attach to novel words which sound unnatural. I conducted another experiment and it turned out that the results of the experiment were compatible with this prediction. Therefore we are led to the conclusion that agent nouns with this suffix are not produced by rule but stored in associative memory, and that they can be extended to new words on the basis of phonological similarity to existing words. I will refer to the second experiment in Section 7 below.

## 6.2 Attachment of -te to simple verbs

It should be noticed here that the *Kojien* lists only two words with *-te* whose bases are compound verbs consisting of two verbs, whereas the dictionary lists as many as 72 words with this suffix whose bases are simple verbs. This fact will lead us to assume that the bases of the suffix *-te* ordinarily have to be simple verbs, which was tested by the third experiment I conducted that will be shown in Section 7. This assumption also seems to support the proposal that newly formed agent nouns with this suffix are produced by analogy with existing words stored in the lexicon.

It is claimed by Sugioka (1984) that *te*-suffixation occurs in syntax but not in the lexicon. One of the reasons she presents such a conclusion is that (8a), for example, is acceptable but not (8b).

In (8a), *shosetsu* 'novel', a noun corresponding to the internal argument of the base verb *kaki*

‘write’ is outside the derived agent noun *kaki-te* ‘writer’; on the other hand, (8b) as a whole, which is unacceptable, is a compound noun into which *shosetsu* ‘novel’ has been incorporated. But it seems that the attachment of the suffix *-te* only to simple verbs is a very peculiar restriction which would not be imposed on syntactic affixation in general. Another possible alternative would be to adopt a model of level-ordered morphology and suppose that *te*-suffixation applies at Level 1, the lowest level, in the lexicon before compounding rules apply at a higher level (Level 2 or 3). But this supposition is not compatible with a general tendency for Class 1 affixes not to be productive. Moreover, this idea still cannot seem to rule out compounds like the one in (8b) above, because if we consider that after *te*-suffixation applies at Level 1, *shosetsu* and *kakite* can be combined at Level 2 or 3, as is shown in (9) below, and as a result, the unacceptable compound noun *\*shosetsu-kakite* (=(8b)) will be generated.

(9) Level 1	<i>te</i> - suffixation	$[\text{kaki-te}]_N$	‘writer’
Level 2 or 3	compounding	$*[[\text{shosetsu}]_N - [\text{kaki-te}]_N]_N$	‘novel writer’

Thus, a more reasonable proposal seems to be that agent nouns with the suffix *-te* are not generated by a rule but listed in the mental lexicon, and that forms like *\*shosetsu-kakite* are not acceptable because they are not compatible with existing words with *-te* whose bases are simple verbs.

## 7. THREE EXPERIMENTS

In this section, I will explain three experiments I conducted and show their results.

### 7.1 *Experiment 1*

Experiment 1 was conducted to test higher productivity of the agentive suffix *-te* than of the suffix *-nushi*. A total of 84 subjects participated in the experiment. They were all university students and native speakers of Japanese. I used 40 verbs; 20 were existing ones and 20 novel ones. For the 20 existing verbs, 20 nouns with the suffix *-te* and another 20 nouns with the suffix *-nushi* derived from them were prepared, and for the 20 novel verbs, 20 nouns with *-te* and 20 nouns with *-nushi* derived from them were also prepared. In order for each subject to make clear his or her judgements on all the *te*-suffixed or *nushi*-suffixed nouns, none of the base verbs, the *te*-suffixed nouns and *nushi*-suffixed nouns were presented alone, but they were all shown in the context in which a word serving as the internal argument of a base verb occurs.

For example, the expression in (10a) contains the existing verb *okuru* ‘send’ and its internal

argument *kozutsumi* 'package'. Likewise, in (10b) and (10c), the *te*-suffixed noun *okuri-te* and the *nushi*-suffixed noun *okuri-nushi* both occur with the word *kozutsumi*, which functions as the internal argument of the base verb *okuru*.

(10) The existing agent words *okuri-te* and *okuri-nushi* derived from the actual verb *okuru*

- a. *kozutsumi -o [okuru] hito*  
package ACC send person  
'a person who sends packages'
- b. *kozutsumi -no [okuri-te]*  
package GEN send-*te*  
'a sender of packages'
- c. *kozutsumi -no [okuri-nushi]*  
package GEN send-*nushi*  
'a sender of packages'

In (11) below, the novel verb *sakiru* and the agent nouns with the suffixes *-te* and *-nushi* formed from it are indicated, and the word *kozutsumi*, which was also used in Experiment 1, is regarded as their internal argument.

(11) The novel words *sakiri-te* and *sakiri-nushi* derived from the novel verb *sakiru*

- a. *kozutsum-o [sakiru] hito*
- b. *kozutsum-no [sakiri-te]*
- c. *kozutsum-no [sakiri-nushi]*

20 sets were devised in each of which the first three expressions contain existing words as in (10), and the second three expressions contain novel words as in (11), with the internal argument constant in all the expressions. The subjects were asked to judge the naturalness of each expression on a 5-point scale.

The results of Experiment 1 are indicated in Figure 1.

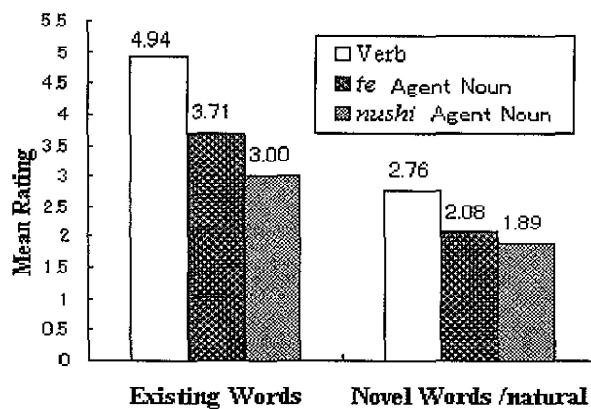


Fig. 1. Mean ratings of naturalness of verbs, *te*-suffixed forms, and *nushi*-suffixed forms for existing words and natural-sounding novel words. The leftmost bar in each set shows

the rating of naturalness of verbs, the middle bar that of *te*-suffixed forms, and the rightmost bar that of *nushi*-suffixed forms.

The set on the left side in Figure 1 indicates the mean ratings of naturalness of existing words, and the set on the right side those of novel words. The leftmost bar in each set shows the mean rating of naturalness of verbs, the middle bar that of *te*-suffixed forms, and the rightmost bar that of *nushi*-suffixed forms. It is clear from Figure 1 that the mean ratings of naturalness of the *te*-suffixed forms are higher than those of the *nushi*-suffixed forms for both the existing and novel words.

I predicted before the experiment that the suffix *-nushi* would be more difficult than *-te* to attach to novel verbs, because the former, unlike the latter, is considered not to be so productive. But the results of Experiment 1 were against that prediction; as suggested in Figure 1, verb naturalness being held constant, the difference in the rating of naturalness between the novel verbs and the novel *nushi*-forms was a little bit smaller (rather than greater) than that between the existing verbs and the existing *nushi*-suffixed words, whereas in the case of the *te*-suffixed forms, almost no such difference was perceived. Why such was the case is not clear to me at present. But it seems that we can conclude that the higher ratings of naturalness of the *te*-suffixed forms indicate that they are formed more productively than *nushi*-suffixed forms.

## 7.2 Experiment 2

The purpose of Experiment 2 was to test whether the attachment of the suffix *-te* to verbs was sensitive to phonological similarity to existing verbs. The subjects were 56 university students different from those for Experiment 1. In the experiment, 20 odd-sounding novel verbs were used in addition to existing verbs and natural-sounding novel verbs which were the same as those used in Experiment 1. None of the odd-sounding novel words used in Experiment 2 obey the phonological constraints shown in (7) above. With each of those constraints, four novel verbs and their corresponding *te*-suffixed nouns were prepared which were against it. The forms in (12) below are the examples of novel verbs and *te*-suffixed forms used in the experiment which do not comply with each constraint in (7).

- (12) *bugar-u, bugari-te* (against (7a))
- kazzur-u, kazzuri-te* (against (7b))
- piser-u, piseri-te* (against (7c))
- remur-u, remuri-te* (against (7d))
- tsokir-u, tsokiri-te* (against (7e))

20 sets were designed in Experiment 2. The first two expressions in each set contain an

existing verb and its corresponding *te*-suffixed noun, as in (10a) and (10b); the second two expressions contain a natural-sounding novel verb and its corresponding form with the suffix *-te* as in (11a) and (11b); and the last two expressions contain an odd-sounding novel verb and the corresponding *te*-suffixed form as in (13a) and (13b) below, where the verb *zagiru*, which is against the constraint (7a), and the derived agent noun *zagiri-te* occur respectively.

(13) a. *kozutsumi -o [zagiru] hito*  
 b. *kozutsumi -no [zagiri-te]*

As in Experiment 1, the subjects were required to judge the acceptability of each expression based on a 5-point scale. The results are shown in Figures 2 and 3.

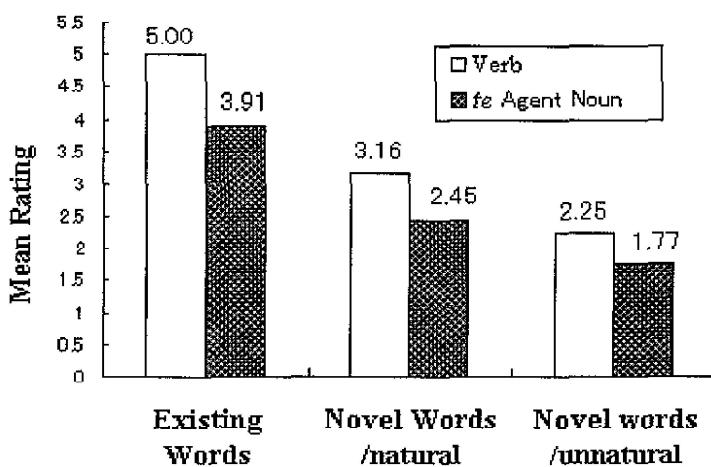


Fig.2. Mean ratings of naturalness of verbs and *te*-suffixed forms for existing words, natural-sounding novel words and odd-sounding ones. The white bar in each pair shows the rating of naturalness of verbs, and the black bar that of *te*-suffixed forms.

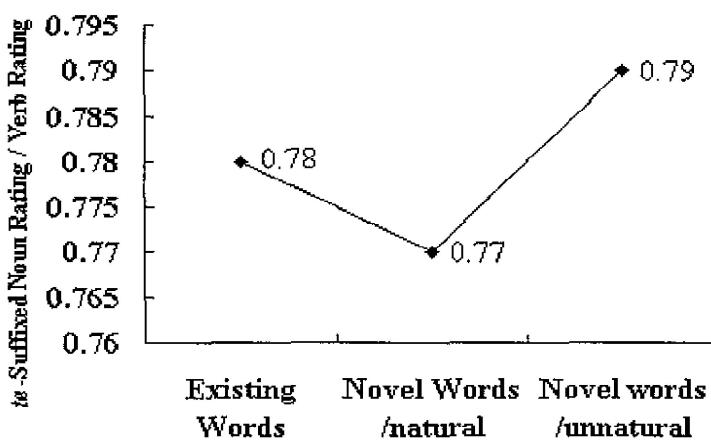


Fig.3. Numerical values obtained by dividing the rating of *te*-suffixed forms into that of verbs for existing words, natural-sounding novel ones, and odd-sounding ones.

The leftmost pair in Figure 2 indicates the mean ratings of naturalness of existing words, the middle pair those of natural-sounding novel words, and the rightmost pair those of odd-

sounding novel words. The white bars in the pairs show the ratings of naturalness of verbs, and the black bars those of the corresponding *te*-suffixed forms. Figure 2 indicates that *te*-suffixed forms decrease in naturalness as they become more deviant from forms with the same suffix whose bases are existing verbs.

The three figures in Figure 3 indicate the numeral values obtained by dividing the rating of *te*-suffixed forms into that of base verbs, and the three numeral values can probably be regarded as almost the same for existing words, natural-sounding novel words, and odd-sounding novel words. This fact suggests that, with verb naturalness constant, there is not so much difference in naturalness between natural-sounding novel verbs and the corresponding *te*-suffixed forms, on the one hand, and on the other, odd-sounding novel verbs and the corresponding *te*-suffixed forms. If it were the case that the decline of the goodness of the odd-sounding novel forms with the suffix *-te* was greater than that of the decline of the odd-sounding novel verbs themselves, then we would be able to claim definitely that the phonologically deviant *te*-suffixed forms do not simply inherit the lack of similarity of their base verbs to the existing verbs, and therefore that added effect of *te*-suffixation per se is observed. But Figure 3 suggests that such was not the case. Therefore, although the fact clear from Figure 2 is that novel forms with *-te* which were phonologically dissimilar to existing Yamato words were lower in acceptability than those which were phonologically similar, this fact cannot be considered to verify the hypothesis that agent nouns with *-te*, when newly produced, are obtained by analogy with existing words, not by rule. But it seems that we can conclude at least that the results of Experiment 2 are compatible with the above-mentioned hypothesis.

### 7.3 Experiment 3

I conducted Experiment 3 in order to test whether the suffix *-te* attaches only to simple verbs. Ten expressions like (14a) below in which *-te* has attached to simple verbs and another ten expressions like (14b) in which the same affix has attached to compound verbs consisting of two verbs were designed.

In all the ten expressions in which a compound verb occur, a word to which the genitive marker *-no* has attached can be interpreted as the internal argument of both the first verb and the second verb which comprise the compound verb. For example, in the case of (14b), the noun *suginoki* 'Japanese cedar' can serve as the internal argument of both the verb *kiru* 'cut'

and *taosu* 'fell', which are the two members of the compound verb *kiri-taosu*.

56 university students were the subjects of this experiment, and they were the same as those of Experiment 2. Figure 4 indicates that *te*-suffixed forms whose bases were simple verbs were higher in acceptability than those whose bases were compound verbs.

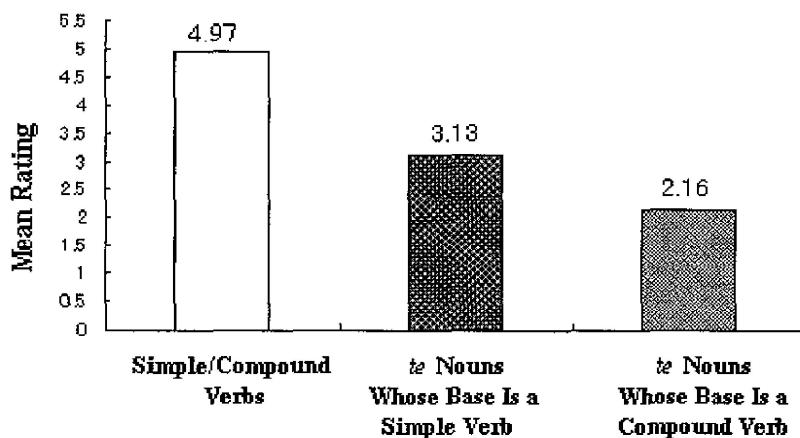


Fig.4. Mean ratings of naturalness of verbs (both simple and compound), *te*-suffixed agent nouns whose bases are simple verbs, and those whose bases are compound verbs.

## 8. CONCLUDING REMARKS AND RESIDUAL PROBLEMS

I have proposed in this paper that the claim I made in Shimamura (1997) that newly formed *te*-suffixed agent nouns derived from verbs in Japanese are produced by analogy with existing words stored in the lexicon but not generated by rule is supported by the three experiments I conducted.

It is well known that some word formations in English are also sensitive to morpheme class distinctions (Aronoff, 1976; Randall, 1980; Baldi et al., 1985; Pinker, 1989). This is exemplified by the well-known fact that the suffix *-ity* can attach only to Latinate stems, whereas *-ness* is indifferent to such distinctions. Here, it is interesting to notice that in (Aronoff, 1976: 51) it is suggested that a feature like [Latinate] «is abstract, much like an abstract syntactic feature.» Such a proposal will make it possible for us to assume that *ity*-suffixation operates without regard to the phonological nature of the base, even if it turns out that Latinate words can be distinguished in part phonologically from native words. But it seems unquestionable that nominals with *-ity* must be examined in some way to see if they are in accord with the phonological patterns which such words normally take. Unfortunately I cannot put forward a sound argument about the interaction between morphology and phonology with respect to morphological processes sensitive to the morpheme class distinctions.

Lastly, I would like to compare between agent noun formations in Japanese and in English. As I have suggested, there is no default agentive suffix in Japanese. Therefore, if we maintain the distinction between meaning-driven morphology and expression-driven morphology proposed by Carstairs (1988), we can conclude that agent noun formation in Japanese falls in expression-driven morphology where there exists gaps, or an «unpredictable nonexistence or non-use of ‘well-formed’ derivations,» while agent noun formation in English belongs to meaning-driven morphology where there is «complete coverage (every cell in the matrix defined by the semantic feature is filled)» (Carstairs, 1988: 88).

I would like to thank Satoko Shirakura for helping me conduct the three experiments referred to in this paper and elicit the results from them. This paper is partially supported by grants from the Ministry of Education in Japan, Grand-in-Aid for COE Research (no. 08CE1001).

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Department of English  
Tsuda College  
2-1-1 Tsuda-machi  
Kodaira-shi, Tokyo 187-8577  
Japan  
[simamura@tsuda.ac.jp]