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## 【 論文 】

# Prefix Difficulty Order among Japanese University Learners of English

Tomoko TAMURA<sup>1</sup> and Tomohiko SHIRAHATA<sup>2</sup>

<sup>1</sup>*Cooperative Doctoral Course in Subject Development in the Graduate School of Education,  
Aichi University of Education & Shizuoka University*

<sup>2</sup>*Academic Institute College of Education, Shizuoka University*

## Abstract

The purpose of this study is to examine the consistency of the difficulty order for the 13 prefixes among Japanese learners of English (JLEs) reported by Mochizuki and Aizawa (2000) (henceforth M&A, 2000). They carried out an affix test with Japanese high school and university students as part of their research to investigate the relationship between JLEs' vocabulary size and their knowledge of affixes. The results showed that the best understood prefixes were *re-*, *un-* and *pre-*, while the least understood were *ante-*, *in-*, and *counter-*.

To find out whether the orders of difficulty for the prefixes among JLEs obtained by M&A (2000) are common to other JLEs, the present study conducted an experiment with 135 university students who had attended English classes at two universities in Japan. The test method used by M&A (2000) was altered in three ways: a) Instead of using a set of three non-existing words for each prefix, such as *antislomad*, *antikiofic* and *antirachy* for the prefix *anti-*, the present study used a pair of real words like *slavery* and *antislavery*; b) the participants were asked to infer the meanings of prefixed words (e.g., *antislavery*) from the meanings of the base words (e.g., *slavery*) given in Japanese instead of answering the meaning of prefixes (e.g., *anti-*); and c) the number of multiple choice responses for each question was increased from four to five. The results showed that despite the differences in the test method, the rankings of M&A (2000) and the present study are highly correlated, with notable similarities in the rankings of *re-*, *pre-*, *non-* and *ante-*. This suggests that a fixed order of difficulty may exist among JLEs for the 13 prefixes.

In addition, the present study proposed a tentative division of the prefixes into six groups according to their difficulties with the aim of improving teaching and learning in English language classrooms in Japan.

## Keywords

language acquisition, prefix difficulty order, Japanese learners of English

## 1. INTRODUCTION

This paper investigates the second language (L2) acquisition of English affixes. It specifically examines the consistency of the difficulty order for the 13 prefixes among Japanese learners of English (JLEs) reported by Mochizuki and Aizawa (2000).

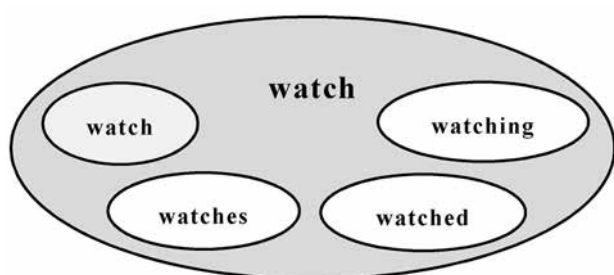
When learning a foreign language such as English, one of the major obstacles that hinder the progress is the difficulty in acquiring vocabulary. It is stressful and endless work for the learners: they always meet new words but cannot necessarily acquire all of them at once. Even if they could, they might forget some of them soon. Such negative experiences often discourage the learners and they may tend to end up losing their

motivation for learning. There is a critical need to find the ways that help the learners learn new words more efficiently and effectively.

Nation (2013) suggested the following three ways to increase vocabulary: a) by being taught or deliberately learning new words, b) learning new words by meeting them in context, and c) recognizing and building new words by gaining control of word parts such as prefixes and suffixes. The first and second ways are used quite pervasively in English language classrooms in Japan, but the third way is not so prevalent compared to the other two.<sup>1</sup> This last way of utilizing affixes may be quite effective for increasing the vocabulary size of JLEs and the authors believe it is worth exploring the

possibility.

Bauer and Nation (1993) (henceforth B&N, 1993) claimed that the notion of *word family* would be useful for teaching and learning of vocabulary. A word family consists of a base word and all its derived and inflected forms. For example, as in Figure 1, the word family of *watch* consists of the base word *watch* and its derived and inflected forms like *watches*, *watched* and *watching*. B&N (1993) argued that once the learners learn the base word or even a derived word, it will be much easier for them to recognize other members of the same word family. However, in order to facilitate the recognition, they need certain knowledge of inflectional and derivational affixes. The question is, to what extent do they have the knowledge of affixes.



(Adapted from Bauer & Nation, 1993)

Figure 1. Word family

This study will focus on derivational prefixes and see how well they are known to JLEs. The organization of this paper is as follows. Section 2 explains the background of this study. Section 3 describes the details of the experiment. Section 4 is for the results and discussions and the conclusions are presented in Section 5.

## 2. BACKGROUND

### 2.1. Word Structure

First of all, let us present a brief summary of the structure of words and a definition of a *prefix*. Words are made up of *morphemes*, which are the smallest linguistic units that have meaning and/or serve a grammatical function in a language (Katamba, 1994). For example, in Figure 2, the word *unthinkable* is consisted of *un-*, *think* and *-able*, which are all morphemes. A morpheme which forms the core of a word, with nothing else attached to it, is called a *root* (Katamba, 1993, 1994). In the word *unthinkable*, *think* is the *root* of the word. A *base* is a term for any

form to which affixes of any kind, either inflectional or derivational, can be added (Bauer, 1983). Thus in this case, *thinkable* is a base to which the affix *un-* is attached. The root *think* can also be called a base to which the affix *-able* is added.

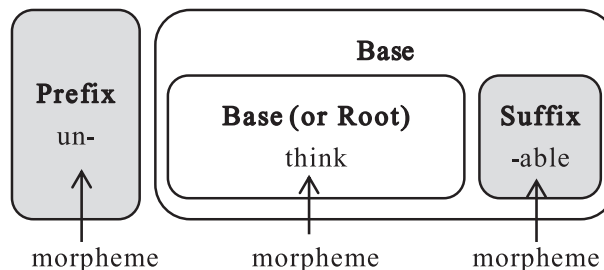


Figure 2. Word parts

Finally, *affixes* are any morphemes that can be attached before or after a base. An affix attached before a base is called a *prefix*, while that attached after a base is called a *suffix* (Bauer, 1983; Katamba, 1993, 1994). In the case of the word *unthinkable*, *un-* is a prefix while *-able* is a suffix.

A prefix usually changes the meaning of the base. For example, when the prefix *un-* is attached to the base *thinkable* as in (1a), it gives the opposite meaning to the base word. A suffix, on the other hand, usually changes the word class of the base. For instance, the verb *think* changes its word class to adjective when the suffix *-able* is added to it, as shown in (1b) (Namiki, 1985; Oishi, 1988; Quirk et al., 1985).

(1a). A prefix usually changes the meaning of the base.

*thinkable* → *unthinkable*

b. A suffix usually changes the word class of the base.

*think* (V) → *thinkable* (Adj)

### 2.2. Universal Order of Acquisition

One of the major topics in the studies of L2 acquisition has been the concept of a universal order of acquisition. In particular, the order for English grammatical morphemes has been thoroughly investigated due to the reason that they are easily observable in learners' utterances (Dulay & Burt, 1974; Dulay, Burt & Krashen, 1982; White, 2003; Ellis, 2008).

These morpheme studies included inflectional affixes such as plural *-s* and progressive *-ing*, but not derivational affixes such as *un-* and *-er*. It is highly conceivable that a common order of acquisition may

also exist for derivational affixes as well as inflectional ones. This paper explores the possibility of the existence of a common difficulty order for derivational prefixes among JLEs by examining the difficulty order for the 13 prefixes reported by Mochizuki and Aizawa (2000).

### 2.3. Previous Studies

Mochizuki and Aizawa (2000) (henceforth M&A, 2000) carried out an affix test, which was a part of their survey to investigate the relationship between learners' vocabulary size and their affix knowledge. The participants were 403 Japanese high school and university students and they took a 30-minute test at the end of a semester. For the test, 13 prefixes and 16 suffixes were chosen based on B&N's (1993) Affix Levels and Nation's (1996) Vocabulary Lists. The test was a multiple choice task and was consisted of two parts, the prefix section and the suffix section. In each section, the participants were given three non-existing words sharing the same affix such as *antislimad*, *antikiofic* and *antirachy*, as shown in Table 1. They were then asked to choose the best meaning for the prefix from a set of four choices, such as *human*, *of antenna*, *opposed* and *ancient*.

Table 1

Examples of M&A's (2000) Test

1. <u>antislimad</u>	<u>antikiofic</u>	<u>antirachy</u>
(1) human	(2) of antenna	
(3) opposed	(4) ancient	
2. <u>premisforic</u>	<u>prevake</u>	<u>prehaulion</u>
(1) supporting	(2) through	
(3) before	(4) behind	

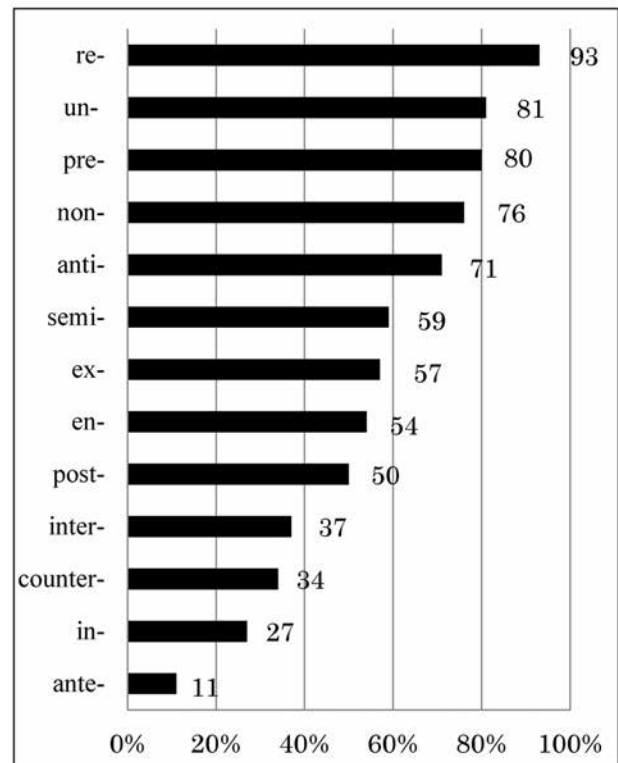
(Adapted from Mochizuki & Aizawa, 2000: p.302)

Note. The multiple choice responses (1)-(4) were given in Japanese.

The results of the experiment are presented in Figure 3. The accuracy rates of the prefixes *re-*, *un-*, *pre-*, *non-* and *anti-* were high while those of *ante-*, *in-*, *counter-* and *inter-* were low.

The question to be raised is whether M&A's (2000) order of difficulty for the 13 prefixes is common to JLEs. If the present study obtains similar results with

different tests and different participants, it will be increasingly likely that the order is consistent among JLEs. If not, M&A's (2000) results leave room for further study.



(Adapted from Mochizuki & Aizawa, 2000: p.298)

Figure 3. M&A's (2000) difficulty order of the 13 prefixes

## 3. EXPERIMENT

### 3.1. Participants

An experiment was conducted with 135 JLEs studying at two universities in Japan. The participants were all undergraduate students taking English classes as their required or elective subjects and their English proficiency level ranged from elementary to intermediate (the average TOEIC score 443 with the lowest score 295 and the highest 625).

### 3.2. Materials and Procedures

The test was designed to assess familiarity with the 83 affixes listed in B&N (1993), including the 13 prefixes chosen by M&A (2000) (*ante-*, *anti-*, *counter-*, *en-*, *ex-*, *in-*, *inter-*, *non-*, *pre-*, *post-*, *re-*, *semi-* and *un-*).

The examples of the test are given in Table 2 (See Appendix for details). For each prefix, the participants were given a pair of a base word and its prefixed word, such as *accept* and *preaccept*, with the meaning of the base word in Japanese such as *ukeireru*. They

were then asked to infer the meaning of the prefixed word and to choose the most appropriate answer from a set of five choices given in Japanese<sup>2</sup>. The major differences between M&A's (2000) test and the test of the present study are: a) the latter used a set of two real words instead of three non-existing words, b) asked the meaning of the prefixed words instead of the prefixes, and c) increased the number of choices from four to five<sup>3</sup>.

The test was a multiple choice task, asking one question for each prefix, and was conducted in April 2015. There was no time restriction, but participants answered all the questions within 25 minutes.

Table 2

*Examples of the Test*1. accept 受け入れる → **preaccept**

- (a) すべて受け入れる (b) 一部受け入れる  
(c) 前もって受け入れる (d) 後から受け入れる  
(e) 受け入れ態勢を整える

2. argument 議論、主張 → **counterargument**

- (a) 論争 (b) 激論 (c) 反論  
(d) 論破 (e) 論文

## 4. RESULTS AND DISCUSSION

Table 3 shows the rate of correct responses. The prefix with the highest accuracy rate was *non-*, marking 96.3 percent, followed by *semi-*, marking 90.4 percent. The subsequent prefixes were *pre-*, *re-* and *anti-* in the 80 plus-percent range, *un-* (74.1 percent), *counter-* (68.1 percent), *en-* and *in-* in the 50 plus-percent range and *inter-* and *ex-* in the 40 plus-percent range. The prefix *post-* was 23.0 percent and *ante-* was below the chance level of 20 percent.

These results are also presented in Figure 4, which graphically illustrates the difficulty order obtained

from this study. The order reveals that the prefixes *non-*, *semi-*, *pre-*, *re-* and *anti-* are easy for university JLEs, with the accuracy rates of over 80 percent, while *ante-*, *post-*, *ex-*, *inter-*, *in-* and *en-* are difficult, with the accuracy rates below 60 percent.

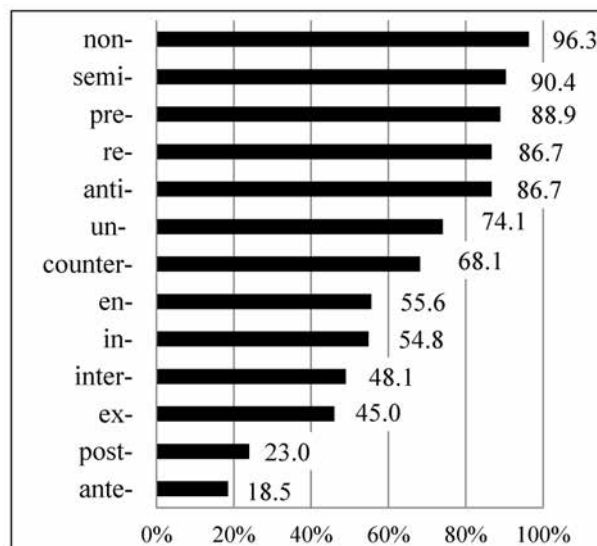


Figure 4. Difficulty order of the 13 prefixes obtained from the present study

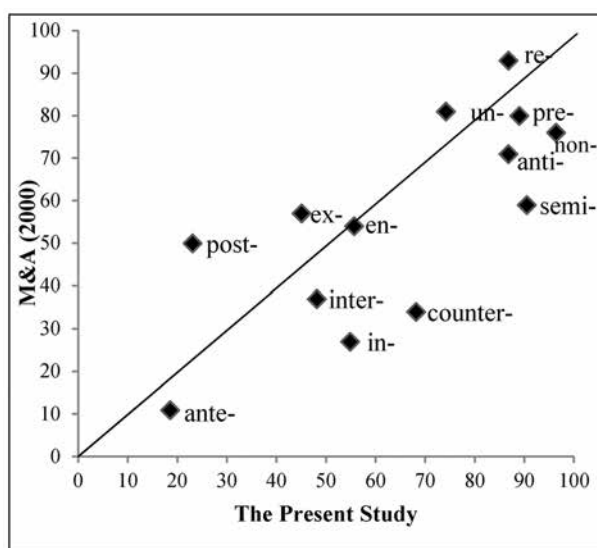


Figure 5. The comparison between the results of M&amp;A (2000) and the present study

Table 3

*The Rate of Correct Responses*

Prefix	non	semi	pre	re	anti	un	counter	en	in	inter	ex	post	ante
Rate of correct responses	96.3	90.4	88.9	86.7	86.7	74.1	68.1	55.6	54.8	48.1	45.0	23.0	18.5
%	(130)	(122)	(120)	(117)	(117)	(100)	(92)	(75)	(74)	(65)	(61)	(31)	(25)

Note. The numbers of correct responses are in parentheses. n=135.

The comparison between the results of M&A (2000) and the present study is demonstrated in Figure 5. The similarity is that in both studies, *ante-* is the most difficult prefix and *re-*, *pre-* and *non-* are the easy ones. On the other hand, the accuracy rates of *semi-*, *post-*, *counter-* and *in-* are very different.

To see whether M&A's (2000) difficulty order and that of the present study are correlated or not, the authors obtained Spearman's Rank Correlation Coefficient. The result shown in Table 4 reveals that the difficulty rankings of the two studies are highly correlated ( $p = .7153$ ).

**Table 4**  
*Spearman's Rank Correlation Coefficient*

	The Present Study
Mochizuki & Aizawa (2000)	0.7153

Note that this result was obtained despite the differences in the test methods between the two studies. It increases the possibility that a fixed order of difficulty exists among JLEs for the 13 prefixes. This is a significant point because the existence of a common difficulty order has been confirmed for grammatical morphemes including inflectional affixes but not for

derivational affixes.

Next, a Friedman test was conducted to see whether the differences in the number of accurate responses to the prefixes obtained from the present study are statistically significant or not. The results given in Table 5 indicate that there is a statistically significant difference among the numbers of accurate answers for the prefixes ( $p = .0000$ ).

**Table 5**  
*The Results of Friedman Test*

Chi-square value	Degree of freedom	p-value
461.0811	12	0.0000**

\*\*  $p < .01$

Scheffe's Multiple Comparison was subsequently conducted to determine between which pair of prefixes differences are statistically significant. The results of the analysis are given in Table 6, revealing that for example, the differences between *non-* and five prefixes (*semi-*, *pre-*, *re-*, *anti-* and *un-*) are not significant, but the differences between *non-* and seven prefixes (*counter-*, *en-*, *in-*, *inter-*, *ex-*, *post-* and *ante-*) are significant. For other prefixes, please see the table.

**Table 6**  
*The Results of Scheffe's Multiple Comparison*

Difficulty order	1	2	3	4	5	6	7	8	9	10	11	12	13
Prefix	non	semi	pre	re	anti	un	counter	en	in	inter	ex	post	ante
1 non													
2 semi	ns												
3 pre	ns	ns											
4 re	ns	ns	ns										
5 anti	ns	ns	ns	ns									
6 un	ns	ns	ns	ns	ns								
7 counter	*	ns	ns	ns	ns	ns							
8 en	**	**	**	**	**	ns	ns						
9 in	**	**	**	**	**	ns	ns	ns					
10 inter	**	**	**	**	**	ns	ns	ns	ns				
11 ex	**	**	**	**	**	*	ns	ns	ns	ns			
12 post	**	**	**	**	**	**	**	**	**	**	ns	ns	
13 ante	**	**	**	**	**	**	**	**	**	*	ns	ns	ns

\*  $p < .05$  \*\*  $p < .01$



Table 7

Six Prefix Categories Based on Statistical Results

Category	Easy ← → Difficult											
	1	2				3	4			5	6	
Prefix	non	semi	pre	re	anti	un	counter	en	in	inter	ex	post ante
1 non												
2 semi	ns											
3 pre	ns	ns										
4 re	ns	ns	ns									
5 anti	ns	ns	ns	ns								
6 un	ns	ns	ns	ns	ns							
7 counter	*	ns	ns	ns	ns	ns						
8 en	**	**	**	**	**	ns	ns					
9 in	**	**	**	**	**	ns	ns	ns				
10 inter	**	**	**	**	**	ns	ns	ns	ns			
11 ex	**	**	**	**	**	*	ns	ns	ns	ns		
12 post	**	**	**	**	**	**	**	**	**	ns	ns	
13 ante	**	**	**	**	**	**	**	**	**	*	ns	ns

\*  $p < .05$  \*\*  $p < .01$

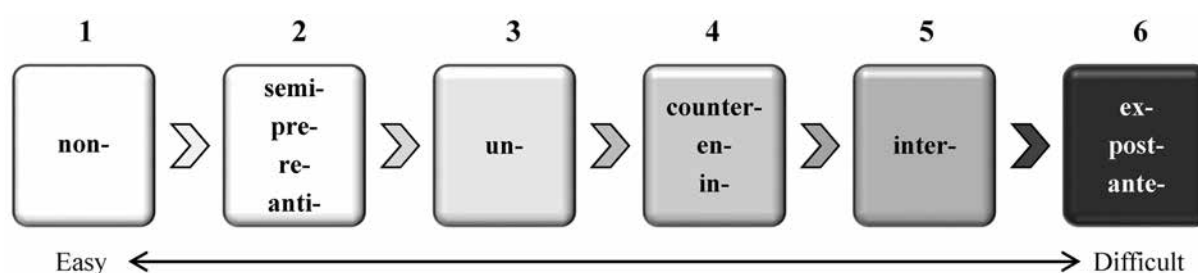


Figure 6. Six prefix difficulty rankings proposed in the present study

Based on these results, the authors have tentatively classified the 13 prefixes into six groups for JLEs as in Table 7 and Figure 6 according to the statistical differences among the accuracy rates of the prefixes. These groupings, or the rankings, indicate clear-cut boundaries among the prefixes as to their degree of difficulty. The first group solely contains the easiest prefix *non-*, followed by the second group including less easy prefixes such as *semi-* and *pre-*. The third and the fourth groups are for the prefixes of medium difficulty such as *un-* and *counter-*. The fifth group only includes *inter-*, a difficult prefix, and the last group is consisted of the most difficult prefixes *ex-*, *post-* and *ante-*.

It is not yet clear what factors are responsible for these orders. However, there are three plausible causes. The first one is the properties of the prefixes. Kageyama (1999) claims that the three negative prefixes *non-*, *un-* and *in-* in English all differ in their

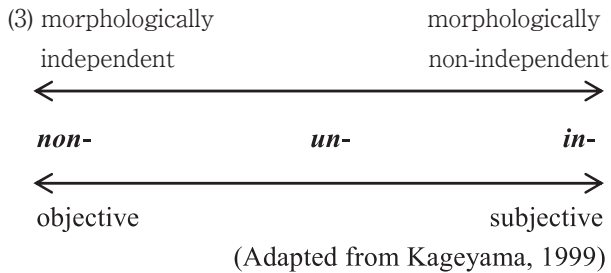
degree of phonological and morphological independence. He observes that a) *non-* as in (2a) attaches to a free (i.e., independent) morpheme, does not change its form and is clearly pronounced; b) *un-* as in (2b) also attaches to an independent morpheme and does not change its form, but is weakly pronounced; and c) *in-* as in (2c) sometimes attaches to a bound (i.e., non-independent) morpheme and changes its form to *im-*, *ir-* or *il-* depending on the first sound of the base word, indicating that it is not morphologically independent or the degree of its independence is low.

(2)a. *nonalcoholic*, *non-christian*, *nonconformist*,  
*nonessential*,

b. *unhappy*, *unkind*, *unpleasant*, *unlucky*

c. *incorrect*, *impossible*, *irregular*, *illegal*, *insipid*,  
*inert*

(Adapted from Kageyama, 1999)



The third plausible reason lies in the number of appearances of the prefixes in learners' English textbooks used in Japan. For example, the frequent appearances of derived words with *re-* may help the learners acquire the prefix earlier than the non-appearing prefixes such as *ante-*. The authors are currently in the process of collecting and analyzing data and would like to report the results in their future research.

To summarize, the present study examined the consistency of the difficulty order for the 13 prefixes among JLEs reported by M&A (2000). The order

The findings of the present study may provide the following suggestions for teaching: a) Among the 13 prefixes, the prefix *ante-* is difficult but the prefixes *non-*, *semi-*, *pre-*, *re-* and *anti-* are easy for JLEs; and b) English teachers in Japan should have such knowledge of JLE's affix difficulty order.

Such negligence of teaching affixes can be attributed



to the lack of subjects on vocabulary and vocabulary teaching in the current teacher training program provided for pre-service and in-service English teachers in Japan. The teachers themselves have little opportunity to gain knowledge about word structure and affixes, which probably is the reason why they shy away from utilizing word parts when teaching vocabulary.

2. As for the polysemous prefixes, the authors selected only one meaning to be included in the multiple choices so that the participants will not be able to find two or more correct answers.

3. The authors provided five choices instead of four to lower the chance level. The choices of six or more were avoided so that the test would not be too much burden on the participants.

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【CONTACT Tomoko TAMURA  
 E-mail: tamura.tomoko.15@shizuoka.ac.jp】

## APPENDIX

## 派生語プレテスト

右側の太字の語の意味として最も適切なものを、(a) ～ (e) の選択肢の中からひとつ選びなさい。

1. metal 金属 → **nonmetal**

- (a) 貴金属 (b) 超合金 (c) 金属疲労 (d) 非金属 (e) 重金属

2. conscious 意識している → **unconscious**

- (a) 潜在意識の (b) 意識がそれた (c) 意識のない (d) 意識過剰な (e) 意識を超えた

3. secure 安心な → **insecure**

- (a) 保安の (b) 安心感のある (c) 安心している (d) 安全な (e) 不安な

4. slavery 奴隷制 → **antislavery**

- (a) 奴隷制度廃止 (b) 奴隷制度反対 (c) 奴隷制度復活 (d) 奴隷制度存続 (e) 奴隷制度防止

5. cage 檻 → **encage**

- (a) 檻に入れる (b) 檻から出す (c) 檻から逃げる (d) 檻を施錠する (e) 籠を開ける

6. dependence 依存 → **interdependence**

- (a) 共依存 (b) 依存心 (c) 依存性 (d) 依存状態 (e) 相互依存

7. election 選挙 → **post-election**

- (a) 選挙結果 (b) 選挙後 (c) 落選 (d) 補欠選挙 (e) 選挙ポスター

8. diameter 直径 → **semi-diameter**

- (a) 半径 (b) 口径 (c) 円周 (d) 直径記号 (e) 球面

9. mortem 死 → **antemortem**

- (a) 生の (b) 生死の (c) 瀕死の (d) 死の前の (e) 死後の

10. argument 議論、主張 → **counterargument**

- (a) 論争 (b) 激論 (c) 反論 (d) 論破 (e) 論文

11. soldier 兵士 → **ex-soldier**

- (a) 一等兵 (b) 兵役 (c) 軍隊 (d) 元兵士 (e) 負傷兵

12. accept 受け入れる → **preaccept**

- (a) すべて受け入れる (b) 一部受け入れる (c) 前もって受け入れる  
(d) 後から受け入れる (e) 受け入れ態勢を整える

13. generate 生み出す、発生させる → **regenerate**

- (a) 発生を促す (b) 再生する (c) 常に発生させる (d) 退化させる (e) 消滅させる

# 日本人大学生英語学習者の接頭辞の難易度順序

田村 知子<sup>1</sup>・白畑 知彦<sup>2</sup>

<sup>1</sup> 静岡大学教育学研究科後期3年博士課程・<sup>2</sup> 静岡大学大学院教育学領域

## 要約

本研究の目的は、Mochizuki & Aizawa (2000) (以下 M&A, 2000) により報告された、日本人英語学習者における13種類の接頭辞の難易度順序の一貫性を調査することである。M&A (2000) は、日本人英語学習者の語彙サイズと接辞の知識の関係を調べる研究の一環として、日本人高校生及び大学生を対象に接辞テストを実施した。結果は、最も理解度の高い接頭辞が re-、un-、pre-、最も理解度が低い接頭辞が ante-、in-、counter- であった。これらの順序が、日本人英語学習者に共通する接頭辞の難易度順序であるのかどうかを調べるために、本研究では、日本国内の2つの大学で英語の授業を受講する135人の大学生を対象に実験を行った。その際、M&A (2000) の使用したテスト方法に、以下の3つの変更を加えた。1) 各接頭辞につき、実在する2組の語 (例: slavery と antislavery) を用いた。2) 実験参加者たちに、接頭辞が付加した語 (例: antislavery) の意味を、基体 (例: slavery) の日本語の意味から推測するよう指示した。3) 各質問に対する選択肢の数を5つとした。結果として、テスト方法の違いにも関わらず、M&A (2000) と本研究の難易度順序との間には高い相関が得られ、re-、pre-、non- 及び ante- の順位に顕著な類似がみられた。このことは、日本人英語学習者の間に、13種類の接頭辞に関して、何らかの一定した難易度順序が存在する可能性があることを示唆している。また本研究では、日本国内の教室における英語学習と指導の向上のために、これらの接頭辞を、難易度に基づき6つのグループに分類することを試みた。

## キーワード

言語習得、接頭辞の難易度順序、日本人英語学習者