

# Building Japanese-Chinese Translation Dictionary

## Based on EDR Japanese-English Bilingual Dictionary

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### Abstract

We launched a 5-year-project in 2006 to develop a Japanese-Chinese machine translation system for translating scientific and technical papers. As part of that project, we are currently building a Japanese-Chinese translation dictionary based on the EDR Japanese-English bilingual dictionary. This paper presents the design and construction of the Japanese-Chinese translation dictionary, including specifications for translating Japanese information into Chinese and annotating related information, tools developed for assisting manual annotation, and some result that have already been achieved.

## 1 Introduction

Translation dictionaries are an essential language resource in machine translation and cross-language information retrieval. A 5-year-project to develop a Japanese-Chinese machine translation system for translating scientific and technical papers was launched at NICT (National Institute of Information and Communication Technology) in 2006.

Since the project adopts an example-based approach, extracting translation knowledge from parallel corpora through alignment is an important task. Translation dictionaries are indispensable for aligning words or phrases. Therefore, we are developing a Japanese-Chinese translation dictionary that is based on the EDR Japanese-English Bilingual Dictionary, which contains detailed grammatical and semantic information about Japanese words. As the achievement of the work, a trilingual dictionary of Japanese-English-Chinese will be obtained.

## 2 EDR Japanese-English Bilingual Dictionary

The *EDR Electronic Dictionary* (NICT, 2002) was developed for the advanced processing of natural language by computers from fiscal 1986 to fiscal 1994. The *EDR Electronic Dictionary* is composed of concept dictionaries, word dictionaries, bilingual dictionaries and corpora. The EDR Japanese-English Bilingual Dictionary is one of the bilingual dictionaries. The *EDR Electronic Dictionary* is the culmination of a nine-year project. Its intellectual property rights are owned by NICT.

The EDR Japanese-English Bilingual Dictionary contains almost the entire vocabulary of the Japanese language and therefore has high coverage. Each meaning of each Japanese word is stored as one record and the corresponding English translations are stored in the record. The dictionary describes the correspondence between each meaning of each Japanese word and its English translation. There are a total of 364,430 records in the dictionary. The records are arranged alphabetically according to the Japanese syllabary.

One record consists of 6 items: Record Number, Headword Information, Grammatical Information,

Semantic Information, English Translation Information, and Management Information. The Headword Information has two sub-items, Grammatical Information has one sub-item, Semantic Information has 5 sub-items, and English Translation Information has 3 sub-items. The data structure of a record is shown in Figure 1.

```
<Record Number>
<Headword Information> : <Kanji Notation >
                        <Kana Notation >
<Grammatical Information> : <Part of Speech >
<Semantic Information> : <Concept Identifier>
                        <Japanese Headconcept>
                        <English Headconcept>
                        <Japanese Concept Explication>
                        <English Concept Explication>
<English Translation Information>:
                        <English Word Category>
                        <English Word Notation>
                        <English Word Part of Speech >
< Management Information >
```

Figure 1 Data structure of EDR Japanese-English Bilingual Dictionary.

Each record is given a concept identifier. The <Concept Identifier> is a number that uniquely identifies the concept. The concept provides the information necessary to discriminate between the various meanings of the words contained in the Japanese-English Bilingual Dictionary. Using the concept identifier, you can retrieve the concept dictionaries to obtain detailed information about the concept and super/sub concept.

<Japanese Headconcept> (<English Headconcept>) is a headword in Japanese (English) that best represents the concept and therefore allows people to easily form an image of the concept. Some special concepts in Japanese do not exist in English. In these cases, the <English Headconcept> is nil.

<Japanese Concept Explication> (<English Concept Explication>) is a written explanation of the concept in Japanese (English) words. Concept explications are provided in order to help people distinguish one concept from another concept.

Most <Japanese Headconcepts> are single words, while most <Japanese Concept Explications> are phrases or sentences.

Since different meanings of one Japanese word are arranged in different records, a word that has more than one meaning will have a few records in which <Headword Information> are identical but <Semantic Information> and <English Translation Information> contain different contents. Figure 2 shows an example of a record.

|                                  |  |
|----------------------------------|--|
| < Record Number >                | JEB0368581                                   |
| < Kanji Notation >               | さえずる   |
| < Kana Notation >                | サエズ・ル  |
| < Part of Speech >               | 動詞 (verb)                                    |
| < Concept Identifier >           | 3bbd74                                       |
| < Japanese Headconcept >         | さえずる[サエズ・ル]                                  |
| < English Headconcept >          |  |
| < Japanese Concept Explication > | 舞楽において、朗詠する                                  |
| < English Concept Explication >  | in Japanese court dance and music, to recite |
| < English Word Category >        | 0  |
| < English Word Notation >        | recite                                       |
| < English Word Part of Speech >  | 動詞及び動詞句(verb and verb phrase)                |
| < Management Information >       | DATE="95/2/15"                               |

Figure 2 Example of record in EDR Japanese-English Bilingual Dictionary.

### 3 Automatic Acquisition of Chinese Translation

We developed a method to automatically construct a Japanese-Chinese translation dictionary. Many electronic bilingual dictionaries that translate between English and another language have been thoroughly developed; however, bilingual dictionaries that translate between two languages that do not include English have not been thoroughly developed. Recently, the amount of electronic data written in languages other than English has significantly increased and bilingual dictionaries for pairs of languages that do not include English are therefore needed urgently for machine translation. However, the development of an electronic translation dictionary is expensive and time consuming. Automatically constructing a translation dictionary for new language pairs using existing electronic resources is a possible solution because it saves time and money. Here we briefly describe our work on automatically constructing a Japanese-Chinese translation dictionary using English as an intermediary (Zhang, et al, 2005).

We used two existing electronic dictionaries: the EDR Japanese-English Bilingual Dictionary and the LDC English-Chinese dictionary (LDC, 2002). The LDC English-Chinese dictionary has 110,830 records and each record is composed of an English word and its Chinese translation. There is no grammatical or semantic information. An example of a record is shown in Example 1.

**[Example 1]** stout /强壮的/坚固的/坚强的/稳重的/勇敢的/激烈的/胖胖的/丰富的/烈啤酒/肥硕的/肥硕的/

Although the idea of automatically acquiring bilingual lexicons through English is not novel, the problem of how to select correct translations from among a large number of candidates remained unresolved. We developed a ranking method in which candidate Chinese translations

are ranked by utilizing three sources of information: the intersection degree of the English translations between the Japanese word and the candidate Chinese translation, the matching of the parts of speech between the Japanese word and the candidate Chinese translation, and the translation correspondence between the Japanese word in kanji and the Chinese characters of the candidate Chinese translation.

Candidate Chinese translations were obtained for 144,002 records. All the candidate Chinese translations of each record were ranked using the above ranking method. An evaluation was carried out on the Japanese records that had more than 20 candidate Chinese translations. There were 37,528 such records. We randomly selected 3% of records and obtained 109 records for our test data. The experimental result showed that 81.4% precision was achieved for the top ranked candidate Chinese translations.

Some examples of the ranked candidate Chinese translations (within top 3) are shown in Table 1 of the appendix. The examples are arranged in descending order of the number of candidate Chinese translations. The candidate Chinese translations that are underlined are the correct translations. In addition, we investigated 64 Japanese records of the test data in which the orthographies of the Japanese words were different from the ones of the corresponding Chinese translations. We investigated using a Japanese-Chinese translation dictionary from the Japanese Yahoo website. We found that 22 Japanese words exist in that dictionary, while the remaining 42 Japanese words did not (they are enclosed in a square in Table 1 in appendix). We therefore found that the approach obtained Japanese-Chinese bilingual lexicons that were not in the existing electronic dictionary.

In this way, candidate Chinese translations for 144,002 records were automatically obtained (about 40% of the EDR Japanese-English Bilingual Dictionary). The remaining 220,428 records (about 60% of the records) did not have candidate Chinese translations because the corresponding English translations were not single words, but phrases or sentences. Human translation was therefore needed.

The automatically obtained candidate Chinese translations in this section will be examined manually to provide Chinese translation variations. We will describe the manual selection in the next section.

### 4 Manual Annotation

Manual annotation means (1) human translation of Japanese into Chinese, (2) tagging of related information such as parts of speech, and (3) human selection of correct translations from the ranked candidate Chinese translations described in Section 3. (1) and (2) are conducted on all records and (3) is conducted on the records for which the ranked candidate Chinese translations were obtained using automatic acquisition.

#### 4.1 Annotation Contents

Each record of the EDR Japanese-English Bilingual Translation is annotated manually with the following information.

##### (1) <Chinese Translation>

(2) <Part of Speech> or <Grammatical Category >

Each Chinese translation is annotated.

(3) <Register Information>

Each Chinese translation is annotated.

(4) <Chinese Headconcept>

Chinese translation of <Japanese Headconcept>

(5) < Chinese Concept Explication >

Chinese translation of <Japanese Concept Explication>

(6) <Chinese Translation Variation>

In addition to <Chinese Translation>, variant Chinese translations are also annotated in order to increase recall rate in word alignment.

## 4.2 Specification for <Chinese Translation>

<Chinese Translation> is annotated according to the meaning defined by the <Japanese Headconcept> and <Japanese Concept Explication> in its record.

If the concept of the record exists in the Chinese language, the Chinese word that represents the concept is annotated. When there is more than one Chinese translation, all of them are annotated. In this case, the order of the Chinese translations is arranged by the translators based on their experience of how frequently the translations are used.

There is a special case in which one Japanese concept has semantically different Chinese translations. For example, the Japanese word “叔父(uncle)” has different Chinese translations “叔叔 (the brother of the father) ” and “舅舅 (the brother of the mother )”. In this case, distinguishing information for the different translations is also annotated. For such kinds of Japanese words, we therefore annotate different Chinese translations and corresponding supplementary information in order to indicate these types of conceptual differences.

Records whose concepts do not exist in the Chinese language are translated into Chinese in one of the following ways.

### Literal translation (i.e. word for word translation)

#### Paraphrase

Paraphrase the Japanese concept before translating it into Chinese. If the final Chinese translation has the same meaning as the original Japanese concept, it is deemed a good translation.

#### Transliteration using Roman alphabet

Convert the kana notation into the Roman alphabet and then represent the Roman alphabet using Chinese phonograms.

#### Explanation

Explain the concept in Chinese sentences.

#### Proper noun (place name, person’s name, and organization name)

(1) Kanji expression: Since some kanji have the same orthographies as Chinese characters, they are translated in the following ways. (i) If the kanji have the same

orthographies as the simplified Chinese characters, they are used in the Chinese translation. (ii) If the kanji have the same orthographies as traditional Chinese characters, the corresponding simplified Chinese characters are used. (iii) If the kanji have no orthographies that are the same either as simplified Chinese characters or as traditional Chinese characters, the kanji is used as a Chinese character and the pronunciation in Japanese is adopted. A list of new Chinese characters is used to record such adopted kanji along with pinyin expressions indicating their pronunciation in Japanese.

(2) Katakana expressions: If the Japanese words originated from other languages, like English or German, their pronunciations in the original languages are represented using Chinese phonograms.

## 4.3 Specification for <Chinese Headconcept> and <Chinese Concept Explication >

Usually a <Japanese Headconcept> is a single word. It is translated into <Chinese Headconcept> according to the meaning defined by <Japanese Concept Explication>. Usually a <Japanese Concept Explication> is either sentences or phrases with a modification clause. By translating <Japanese Concept Explication> into Chinese, we can also acquire a parallel Japanese-Chinese corpus. In human translations, the syntactic patterns of the Japanese expressions are used in the corresponding Chinese translation as much as possible if the Chinese translation is natural.

## 4.4 Specification for <Register Information>

We annotate each <Chinese Translation> with the following register information.

### <Translation Category>

Indicates the way in which the Japanese word is translated into Chinese. It has four labels: *Literal*, *Paraphrase*, *Transliteration* and *Explanation*.

### <Style>

Indicates the style level of the translation in the Chinese language. It has five labels: *Archaic*, *Daily Speech*, *Literature* and *Slang*.

### <Formality>

Indicates the level of formality of the translation in the Chinese language. It has three labels: *Honorific*, *Humble* and *Contempt*.

## 4.5 Specification for <Part of Speech> and <Grammatical Category>

In machine translations, grammatical information about words in the target language is required for generating grammatically correct sentences. To do this, we annotate each Chinese translation with the part of speech for single words and grammatical categories for phrases. Each Chinese translation should be recognized as a single word or phrase at first and then annotated with the corresponding category. We determined 18 parts of speech and 11 grammatical categories as follows (Yu, et al, 1997).

**Parts of Speech:** *Noun*, *Temporal*, *Spatial*, *Direction*, *Pronoun*, *Verb*, *Adjective*, *Status*, *Adverb*, *Preposition*, *Conjunction*, *Auxiliary*, *Emphatic*, *Distinction*, *Numeral*, *Quantity*, *Interjection*, and *Onomatopoeia*.

**Grammatical Categories:** *Noun Phrase, Verb Phrase, Adjective Phrase, Preposition Phrase, Quantifying Phrase, Temporal Phrase, Spatial Phrase, Distinction Phrase, Adverb Phrase, Independent Phrase* (include idioms), and *Sentence* (having subject and predicate).

The annotation of part of speech or grammatical category is conducted after the <Japanese Concept Explication> has been translated into Chinese. The available <Chinese Concept Explication> can help annotators who do not know Japanese to understand the meaning of the Japanese words and therefore to decide the role of the Chinese translation. In addition, the parts of speech of both Japanese words and the corresponding English translations can be used as reference. Therefore, Chinese annotators who do not know Japanese are able to undertake this task. In this way, the experience of the experts engaged in the Chinese language resource construction can be used.

#### 4.6 Specification for <Chinese Translation Variation>

We have described the automatic acquisition of candidate Chinese translations in Section 3. Here, we select correct Chinese translations from the ranked candidate Chinese translations and annotate them in the record as <Chinese Translation Variation>. Each candidate Chinese translation is annotated with one of the following three labels: *Correct Translation, Probable Translation* and *Incorrect Translation*. The candidate Chinese translations within the top 10 are labeled. Then the candidate Chinese translations labeled as *Correct Translation* or *Probable Translation* are taken as <Chinese Translation Variation>.

### 5 Assistant Tools

As described above, there are basically two types of annotations. The work of the first type is to translate a Japanese word (<Kanji Notation>), <Japanese Headconcept>, and <Japanese Concept Explication> into Chinese. In this work, the bilingual annotators read Japanese information and then edit Chinese translations. The work of the second type is to annotate the part of speech on Chinese translations. In this work, the annotators read Chinese information only and then select a tag. Accordingly, we designed and implemented two types of assistant tools.

#### 5.1 Assistant tool for translation

The graphical interface of the tool is shown in Figure 3. The tool has the following functions.

(1) When a file is selected, the list of <Kanji Notation> of the records in the file is shown on the left side of the interface. When a <Kanji Notation> is selected, the information of the record is displayed, including <Kanji Notation>, <Kana Notation>, <Part of Speech>, <Concept Identifier>, <Japanese Headconcept>, <English Headconcept>, <Japanese Concept Explication> and <English Concept Explication>.

(2) The translators can edit the content of the <Chinese Translation> and annotate the corresponding register information in the upper blank boxes. Each blank line has five boxes. The first box is used for editing the <Chinese Translation>. The second box displays the annotated part of speech of the <Chinese Translation>. The annotation of part of speech is conducted using the second assistant tool (See 5.2). The boxes from the third to the fifth are

used for assigning <Register Information>, i.e. <Translation Category>, <Style> and <Formality>, respectively. If there is more than one Chinese translation, the corresponding information can be edited in the downward blank boxes.

(3) The translators can edit the content of the <Chinese Headconcept> in the blank box below the displayed content of the <Japanese Headconcept>. In the same way, the translators can edit the content of the <Chinese Concept Explication> in the blank box below the displayed content of the <Japanese Concept Explication>.

(4) Two kinds of searches can be conducted. The first is to search for records that have the same <Concept Identifier>. When records have the same <Concept Identifier>, their <Japanese Headconcept> and <Japanese Concept Explication> usually have the same contents. The Chinese translations that have been annotated early can be searched for later reference. The second is to search the records that have the same <Kanji Notation>.

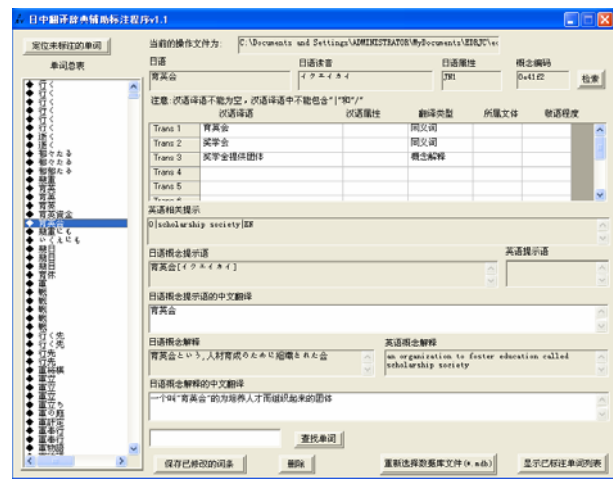


Figure 3 Graphical interface of assistant tool for human translation.

#### 5.2 Assistant tool for part of speech annotation

The graphical interface of the assistant tool for annotation of parts of speech is shown in Figure 4. The tool mainly has the functions as follows.

(1) Information for reference is displayed. In addition to <Chinese Translation>, <Chinese Concept Explication>, <Part of Speech> of the Japanese word, <English Word Notation>, and <English Word Part of Speech> are also displayed.

(2) For each Chinese translation, the annotator decides whether it is a single word or a phrase and then selects one category from the corresponding menu of parts of speech or grammatical category.

(3) The tool can search out records that have been annotated with the same <Chinese Translation>. Using the search results, the annotator is able to annotate or modify the parts of speech of the same <Chinese Translation> in multiple records at the same time.

(4) In order to reduce the cost of manual annotation, automatic annotation of parts of speech (Zhou and Yu, 1994) is first conducted. The tool displays the automatically annotated results in a gray area on the interface and prevents them from being modified by an annotator. The automatic annotation is conducted in this

way: if the Chinese translation exists in the Grammatical Knowledge Base of Contemporary Chinese (about 70,000 Chinese words) and only has one part of speech, the part of speech is annotated. If the Chinese translation has more than one part of speech in the knowledge base, the probable parts of speech will replace the items on the parts of speech menu (18 parts of speech in total). Since the number of probable parts of speech is fewer than 18, the time for the annotator to select one part of speech from the updated menu is greatly reduced.



Figure 4 Graphical interface of assistant tool for part of speech annotation.

## 6 Annotation Results Achieved

The manual annotation of all records began in 2005. To achieve high quality and reduce costs, we are depending on the domestic experts in China, including skilled translators and experts in Chinese language processing.

Before the manual annotation, we sorted 364,430 records based on the contents of their <Concept Identifier>, <Japanese Headconcept>, <English Headconcept>, <Japanese Concept Explication>, and <English Concept Explication>. As a result, we obtained 265,306 different records. The manual annotation is only being conducted on these 265,306 records, and the manually annotated information will be automatically copied to other records that have the same contents in the above five sub-items but different content in <Kanji Notation>.

To achieve high quality, the manually translated <Chinese Translation>, <Chinese Headconcept> and <Chinese Concept Explication> are revised by other high level translators.

The human translation and revision of 40,374 records were finished in 2005. The obtained <Chinese translation>, <Chinese Headconcept> and <Chinese Concept Explication> are 255,013, 171,760 and 565,588 Chinese characters, respectively. One Japanese word is annotated with three Chinese translations on average if we assume one Chinese translation has two Chinese characters. The average sentence length of the <Chinese Concept Explication> is about 14 Chinese characters, indicating one aspect of the obtained Japanese-Chinese parallel corpus.

In 2006, we selected high frequency Japanese words from the remaining records and annotated them. The selected Japanese words are those words that also exist in the word list of JUMAN (JUMAN, 2005), a famous Japanese morphological analyzer. This word list contains about 30,000 words. In 2006, a total of 93,759 records were manually translated and reviewed. The annotation of parts of speech was started in the same year.

A few examples of annotated records are shown in Examples 2, 3, and 4. The contents of <Kanji Notation>, <Chinese Translation>, <English Word Notation>, <Japanese Headconcept>, <Chinese Headconcept>, <English Headconcept>, <Japanese Concept Explication>, <Chinese Concept Explication> and <English Concept Explication> are shown in each line, respectively.

### [Example 2]

育英会

育英会; 奖学金; 奖学金提供团体  
scholarship society

育英会

育英会

nil

育英会という、人材育成のために組織された会

一个叫“育英会”的为培养人才而组织起来的团体

an organization to foster education called scholarship society

### [Example 3]

異口同音

异口同声

consensus; many people saying the same thing; united voices; common consent

異口同音

异口同声

nil

おおぜいと同じことを言うこと

许多人同时说出相同的话

the action where many people say the same thing at the same time

### [Example 4]

居溢れる

拥挤不堪; 人多坐不开

overflow; be filled to overflowing; be overflowing

居溢れる

拥挤不堪; 人多坐不开

nil

(ある場所に)人が大勢集まり入りきれない

(某场所)聚集了許多人, 已经挤不下了

the condition of not being able to get in to a place because it is too crowded

### [Example 5]

イクステンション

大学公开讲座; 公开课; 广播讲座

extension courses

イクステンションコース

大学公开讲座; 广播讲座

extension courses

一般の人々に公開されている大学の講座

大学里向一般人群公开的讲座

university courses that are open to the general public

In addition to <Chinese Translation>, we also added <Chinese Translation Variation>. The Chinese translation variations are selected from the automatically acquired candidate Chinese translations within the top 10 by manually labeling each of them with the labels *Correct*

*Translation, Probable Translation or Incorrect Translation.* The candidate Chinese translations labeled with *Correct Translation* or *Probable Translation* are taken as Chinese translation variations. We analyzed the obtained <Chinese Translation Variation> by comparing them with the <Chinese Translation> made by human translation. These results showed us that the simple manual labeling of the automatically obtained candidate Chinese translations provide variant Chinese translations. Three examples are given in Examples 6, 7, and 8. The meanings of the Japanese words and the Chinese translations in English are shown in parenthesis.

**[Example 6]**

<Kanji Notation>アーティフィシャルだ  
(artificial)  
<Chinese Translation> 人为的  
(artificial; man-made)  
<Chinese Translation Variation>  
*Correct Translation* 人造的;  
(man-made; artificial; imitation)  
人工的;  
(man-made; artificial)  
人为的  
(artificial; man-made)  
*Probable Translation* 娇揉造作的;  
(affected; artificial)  
假造的;  
(invent; fabricate)  
不自然的  
(not naturally)

**[Example 7]**

<Kanji Notation> 相携える  
(join forces; team up; cooperate; work together;  
collaborate)  
<Chinese Translation> 协作  
(cooperate with; cooperation)  
<Chinese Translation Variation>  
*Correct Translation* 合作  
(cooperate; collaborate; work together)  
协作;  
(cooperate with; cooperation)  
协力  
(unit efforts; join in a common effort)  
*Probable Translation* 合伙;  
(form a partnership)  
相助;  
(help each other)  
协同;  
(coordination; teamwork; synergism;)  
合力  
(join forces; pool efforts; make a  
concerted effort)

**[Example 8]**

<Kanji Notation> 合い口  
(knife; dagger; dirk)  
<Chinese Translation> 匕首  
(dagger; stiletto)  
<Chinese Translation Variation>  
*Correct Translation* 匕首;  
(dagger; stiletto)  
刀子;

(small knife; pocketknife)

短剑

(dirk; dagger; half-sword)

*Probable Translation* 餐刀;

(table knife)

菜刀;

(kitchen knife; cook chopper)

小刀;

(knife; pocket knife; small sword)

手术刀

(scalpel; surgical knife)

## 7 Conclusion

We are building a Japanese-Chinese translation dictionary by annotating Chinese translations and related information to the EDR Japanese-English Bilingual Dictionary. This paper presents the specifications for human translation and annotation of the related information, such as parts of speech. The finished part of the Japanese-Chinese translation dictionary has been applied for word alignment and the Japanese-Chinese machine translation of the project. Related results will be reported in other papers. The construction of the Japanese-Chinese translation dictionary will be finished in 2008 and will be available to the public in the near future.

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## Appendix

| Japanese Word | Candidate Chinese Translations (underlining indicates correct translation) |               |               |                 |
|---------------|--|---------------|---------------|-----------------|
|               | #Candidate   | Top 1         | Top 2         | Top 3           |
| <u>羈絆</u>     | 79   | <u>羈絆</u>     | <u>絆</u>      | <u>加枷锁, 桎梏</u>  |
| <u>産み出す</u>   | 59   | <u>产</u>      | <u>产生</u>     | <u>想出</u>       |
| <u>郭大する</u>   | 55   | <u>扩大</u>     | <u>夸大, 放大</u> | <u>可放大</u>      |
| <u>枉惑だ</u>    | 54   | <u>尖, 高明</u>  | <u>聪</u>      | <u>妙, 乖</u>     |
| <u>嘸や</u>     | 53   | <u>一定</u>     | <u>保管, 定当</u> | <u>定然</u>       |
| 勘定            | 49   | <u>代价</u>     | <u>价钱, 价</u>  | <u>估定成本</u>     |
| <u>押さえる</u>   | 49   | <u>压制, 憋</u>  | <u>限于</u>     | <u>按捺, 镇压</u>   |
| <u>有難い</u>    | 47   | <u>有利</u>     | <u>禎</u>      | <u>有望的, 有利的</u> |
| <u>研き上げる</u>  | 46   | <u>好转, 炼</u>  | <u>栽培</u>     | <u>磨光</u>       |
| <u>くぼ地</u>    | 45   | <u>盆地</u>     | <u>洼地</u>     | <u>完全地</u>      |
| <u>育み育てる</u>  | 42   | <u>养育</u>     | <u>护</u>      | <u>扶植, 振兴</u>   |
| 引き取る          | 42   | <u>取</u>      | <u>得到, 受到</u> | <u>非...不可</u>   |
| <u>取りすてる</u>  | 39   | <u>略去, 撤除</u> | <u>摈除, 摈弃</u> | <u>丢开, 搬</u>    |
| <u>補完する</u>   | 37   | <u>补充</u>     | <u>把...补足</u> | <u>补遗, 补角</u>   |
| 受け入れる         | 37   | <u>受到</u>     | <u>受理, 受像</u> | <u>接受</u>       |
| 思う            | 36   | <u>揣</u>      | <u>猜度, 揣测</u> | <u>臆测, 猜想</u>   |
| <u>変化する</u>   | 35   | <u>格变化</u>    | <u>词尾变化</u>   | <u>音调变化</u>     |

Table 1 Evaluation of ranking method on Japanese words that have over 20 candidate Chinese translations.