

# Analysis of Reference Books in Japanese Public Libraries Regarding their Number of Holdings, Frequency of Use, and Price

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## Abstracts

The purpose of this study is to identify important reference books in Japanese public libraries and provide useful information to librarians who are considering purchasing them. We investigated the following three points and compiled lists of reference books: (1) which reference books are held in most Japanese public libraries; (2) which reference books appear most frequently in the reference records; and (3) which reference books are cost-effective considering their price and frequency of use. The number of our sample reference books is 77 and the number of public libraries is 634. We used Calil API, which can perform cross-library searches and OPAC of each library to investigate holdings. As for reference records, we used those recorded in the Collaborative Reference Database maintained by the National Diet Library of Japan. We assume that the number of appearances of a reference book in the reference records represents its frequency of use in libraries. It was found that (1) *Encyclopedia of News in the Meiji Era* (Meiji News Jiten) and *Chronological Table of Japan in the Modern Period* (Kindai Nihon Sogo Nenpyo) were held by most libraries, (2) *Encyclopedia of Japanese People* (Nihon Jinmei Daijiten) and *Encyclopedia of Modern Japanese Literature* (Nihon Kindai Bungaku Daijiten) were the most frequently used, and (3) *Encyclopedia of Modern Japanese Literature* (Nihon Kindai Bungaku Daijiten) and *Encyclopedia of Westerners* (Rainichi Seyo Jinmei Jiten) were the most cost-effective. Libraries that do not hold these books should consider purchasing them.

## 1. Introduction

Reference books are important for reference services (Nagasawa, 1995); however, it has been pointed out that Japanese public libraries do not hold enough reference books (MEXT, 2014; MEXT, 2006). There are some information sources for choosing reference books such as guidebooks, magazines, and websites such as Research Navi (<http://rnavi.ndl.go.jp/rnavi/>). However, the reference books listed in these sources seem to be chosen empirically (for instance, Research Navi introduces reference tools that Japanese National Diet Library staff regarded as useful without showing the objective reasons). Sources and studies that recommend reference books based on objective and quantitative analysis are few.

Against this background, we try to identify reference books that are useful and effective from several viewpoints. More specifically, we investigated the following three points and compiled lists of reference books: (1) reference books held in most Japanese public libraries; (2) reference books appearing most frequently in the reference records; and (3) which reference books are cost-effective considering their price and frequency of use. We assume that the number of appearances of a reference book in the reference records represents its frequency of

use in libraries. Furthermore, we assume that reference books that are held in many libraries, used many times, and comparatively inexpensive are useful, effective, and in this sense, important reference books. The number of our sample reference books is 77 and the number of public libraries is 634.

As for (1), we used Calil API and OPAC of libraries. Calil API can perform cross-library searches among Japanese public, university, and special libraries, which enables us to find libraries that hold the sample reference books efficiently (we used OPAC when Calil failed to find the books as we will mention later). As for (2), we used reference records in the Collaborative Reference Database maintained by the Japanese National Diet Library. As for (3), we identified the prices of the reference books based on various information sources and regarded that “the frequency of use of a reference book” divided by “its price” represents the cost-effectiveness of that book.

## 2. Related Studies

Sugie (2007) investigated five libraries in the Kanto area to determine which health science reference books are held. Her focus was limited to the health science field. Mabe (2011) focused on the availability of reference books that were used in the reference records and investigated (1) which reference books can be purchased, (2) which reference books can be substituted by other media, and (3) which reference books can be borrowed from other libraries. However, his focus was limited to Japanese prefectural libraries and it is not clear which reference books are held in other kinds of libraries such as city libraries.

Mabe et al. (2011) and Yoshida (2014) investigated reference books used in actual reference works. Mabe et al. (2011) investigated reference records in the Collaborative Reference Database and clarified which reference books appeared in them. Yoshida (2014) conducted a questionnaire survey with participants of training in reference services held by the Library Association in Aichi Prefecture. She asked which reference books and reference tools on the Internet were often used.

As mentioned above, there are some studies on reference books; however, few studies have been conducted on reference books held in Japanese public libraries in general.

## 3. Sample Data

In this section, we explain the sample reference books, public libraries, and reference records we investigated in this study.

### 3.1. Sample reference books

We randomly selected sample reference books from those listed in *Japanese Reference Books: How to Select and Use* (Nagasawa et al., 2013). The reason we chose this book is that Masao Nagasawa, the book's first author, is a representative researcher of reference services and the book is very popular among Japanese librarians. In addition, *Japanese Reference Books: How to Select and Use* is the newest guidebook on reference books in Japan as of 2015. There are several guidebooks from which to select sample reference books (Yoshida, 2006); however, we will reserve these options for future research. *Japanese Reference Books: How to Select and Use* consists of eight chapters; we randomly chose 10 reference books from each chapter ranging from chapter 1 to 8. With ten reference books chosen from eight chapters, we ended up with 77 sample reference books because only seven reference books are shown in Chapter 1.

### 3.2. Sample libraries and municipalities

We investigated Japanese prefectural libraries, special ward libraries, city libraries, town libraries, and village libraries. To judge whether they hold specific reference books, we used Calil API and OPAC of each library. Calil API can perform cross-library searches among Japanese libraries, which enables us to find libraries that hold the sample reference books efficiently (as of March 9, 2015, it can search 6,654 libraries) (Calil, 2015). It can retrieve books in most, though not all, Japanese libraries. Therefore, we chose sample libraries from those that Calil API can handle. The numbers of our sample public libraries and the municipalities (such as prefectures, special wards, cities, towns, and villages) they belong to are shown in Table 1. As for prefectural, special ward, and village libraries, they are all that Calil can retrieve (i.e., complete enumeration). As for the city and town libraries, we randomly selected 206 and

75 sample libraries from those that Calil can retrieve.

Table 1. *Number of Sample Municipalities and Libraries*

The Kinds of Libraries	The Number of Sample Municipalities	The Number of Sample Libraries
Prefectural libraries	47	59
Special ward libraries	23	246
City libraries	50	206
Town libraries	50	75
Village libraries	41	48
Total	211	634

### 3.3. Sample reference records

In this study, we investigated reference records in the Collaborative Reference Database (<https://crd.ndl.go.jp/reference/>) maintained by the Japanese National Diet Library and noted how many times our sample reference books were used in the reference records. The Collaborative Reference Database is a database that accumulates reference records reported by various Japanese libraries, such as public and university libraries. As of March 3, 2015, the number of participant libraries was 650. We collected 62,330 reference records on March 19, 2013 and used these for our investigation.

## 4. Methodology

In this section, we will explain our methods: (1) to check whether or not the libraries hold the books; (2) to count the number of appearances of the reference book in the reference records; (3) to investigate the price of the reference book.

### 4.1. How to check whether or not the libraries hold the books

We used the following three methods to examine which reference books Japanese public libraries held: (1) by ISBN via Calil API; (2) by ISBN via each library's OPAC; and (3) by titles via OPAC. With these three methods, we expect to minimize the error regarding libraries that do not hold the books despite the fact that they do in fact have them. We conducted these retrievals from April 17, 2014 to November 27, 2014.

#### 4.1.1. Retrieving books by Calil API based on ISBN

Because Calil API only allows us to search books by ISBN, we first retrieved the sample reference books by ISBN. There are some reference book titles that are assigned multiple ISBNs. For instance, *A New Version of Comprehensive National Poems* (Shinpen Kokka Taikan) consists of ten volumes and an ISBN is assigned to each volume. In such cases, we used three ISBNs as follows. First, we defined  $n$  as a smallest integer that is larger than  $N/2$ , where  $N$  is the total number of volumes of a reference book. For instance, if a reference book consists of nine volumes,  $n$  is defined as 5 (which is larger than  $9/2=4.5$ ). We used three ISBNs of volumes No.  $n-1$ , No.  $n$ , and No.  $n+1$ . As for the yearbook that still continues to be published, we used the three ISBNs of the three latest volumes. We regarded the reference book as being held if one of these three volumes was held. The reason we did not use all the ISBNs of all the volumes was just to reduce investigation costs.

#### 4.1.2. Retrieving books by OPAC based on ISBN

Unfortunately, Calil API sometimes fails to find books. Therefore, we used each library's OPAC when Calil API reported that the books were not held in the library. We retrieved sample

reference books by OPAC based on their ISBN.

#### 4.1.3. Retrieving books by OPAC based on titles

Some OPACs do not allow an ISBN search, and others sometimes fail to find books through an ISBN search. Therefore, we also retrieved books by their titles. Since a title search is more complicated than an ISBN search, we will explain in detail below how we retrieved books by their titles. First, we used MeCab, the Japanese morphological analyzer, and decomposed the titles into words and POS-tags. We then selected the following nine combinations of nouns in titles and used them as search keywords: (1) the first four nouns; (2) the first three nouns and the last noun; (3) the first two nouns and the last two nouns; (4) the first noun and the last three nouns; (5) the last four nouns; (6) the first three nouns; (7) the first two nouns and the last noun; (8) the first noun and the last two nouns; and (9) the last three nouns. If the title was too short to extract four nouns, we tried all the noun combinations as search keywords. In addition, we used the titles of the reference books directly as search keywords without using MeCab.

#### 4.2. Number of times used in the reference records

As we mentioned earlier, we investigated the reference records in the Collaborative Reference Database and noted how many times our sample reference books were used in the reference records. We counted the number of reference books being used just by a simple string match between the titles and description of the records. Therefore, the counts may be slightly smaller than the actual counts of being used because our simple string match cannot find titles that are slightly modified in the records.

#### 4.3. Price and cost-effectiveness of reference books

We assume that the values “number of times that the reference books were used in the reference records” divided by “their price” represent their cost-effectiveness (henceforth we call this value NP). We investigated which reference books are cost-effective and how many libraries hold them.

To find the prices of reference books, we used the following four methods: (1) using information on the Internet; (2) using reference books; (3) checking actual sample reference books; and (4) using the catalogs of the publishers. As for (1), we used OPAC of the Japanese National Diet Library (<https://ndlopac.ndl.go.jp>) and Books.or.jp (<http://www.books.or.jp/>) maintained by the Japan Book Publishers Association. If we could not find the prices by these two websites, (2) we checked *Yearbook of Publication* (Shuppan Nenkan) and *Catalog of Research and Study Reference Books* (Chosa Kenkyu Sankotosho Mokuroku) to find their prices. If we could not find them, we used methods (3) and (4).

In this study, we used the price excluding consumption tax. In the case of multi-volume sample reference books, we investigated the price of all the volumes of the sample reference books. In the case of reference books such as yearbooks, we investigated the prices of reference books that have been published over the past two decades.

## 5. Results

### 5.1. Reference books that many municipalities hold

Some municipalities have multiple public libraries. For instance, 50 cities have 206 libraries in total as we showed in

Table 1. In such municipalities, public libraries sometimes share their collections due to limited budget. In this case, we cannot blame library A for not holding reference book X if library B in the same municipality holds it. Based on this idea, we investigated which reference books are held in each municipality (i.e., not on a libraries basis). Table 2 shows the top 20 reference books that most municipalities hold.

We can see in Table 2, for instance, that 174 municipalities have *Encyclopedia of News in the Meiji Era* (Meiji News Jiten) and the ratio is 82.5%, which is the largest ratio among sample reference books. *Chronological Table of Japan in the Modern Period* (Kindai Nihon Sogo Nenpyo) is held in 75.4% of sample municipalities, which is the second-largest ratio among sample reference books.

The results shown in Table 2 are those on a municipalities basis; however, results on a libraries basis were not significantly different (i.e., reference books listed in Table 2 were held in many libraries).

## 5.2. Reference books that are used many times in the reference records

We investigated how many times our sample reference books were used in the reference records. Table 3 shows the top 20 reference books that were most frequently used. *Encyclopedia of Japanese People* (Nihon Jinmei Daijiten) was used 66 times in the reference records, which was the largest number among the sample reference books. *Encyclopedia of Modern Japanese Literature* (Nihon Kindai Bungaku Daijiten) was used 42 times in the reference records, which was the second-largest amount among sample reference books.

Table 2. Top 20 Reference Books Held in Many Municipalities

	Reference Books' Titles	Prefectures	Special Wards	Cities	Towns	Villages	Municipalities	Ratio
1	Encyclopedia of News in the Meiji Era	47	23	45	37	22	174	82.5%
2	Chronological Table of Japan in the Modern Period	47	23	42	35	12	159	75.4%
3	Techno Atlas of Japan	45	22	40	32	19	158	74.9%
4	Encyclopedia of Modern Japanese Literature	47	23	43	27	6	146	69.2%
5	Dictionary of Direct Words in Japan	47	23	38	26	10	144	68.2%
6	Chronological Table of World History	47	21	38	21	8	135	64.0%
7	Encyclopedia of Musician	47	23	36	21	7	134	63.5%
7	Times World Map: Live Atlas	44	20	33	19	18	134	63.5%
7	Encyclopedia of Japanese People	46	23	39	21	5	134	63.5%
10	Yearbook of Literature	46	23	35	22	7	133	63.0%
11	Series of Full Information	47	23	36	24	2	132	62.6%
12	Dictionary of Foreigner in the Modern Era	47	23	32	23	3	128	60.7%
13	Dictionary of Synonym	46	23	39	11	7	126	59.7%
14	Illustrated Dictionary of Fossil	43	18	32	22	9	124	58.8%
14	A New Version of Comprehensive National Poems	47	22	37	14	4	124	58.8%
16	Encyclopedia of Current Law	43	20	29	20	8	120	56.9%
16	Japanese Reference Book	47	23	36	11	3	120	56.9%
18	Dictionary of Difficult Reading of a Kanji	47	23	32	15	2	119	56.4%
18	Encyclopedia of Cultural Anthropology	47	23	35	11	3	119	56.4%
20	Illustrated Fishes in Colour Revised Edition	43	23	30	15	6	117	55.5%

Table 3. Top 20 Reference Books That Were Most Frequently Used in the Reference Records

	Reference Books' Titles	Number of Being Used in the Reference Records	Prefectures	Special Wards	Cities	Towns	Villages	Municipalities	Ratio
1	Encyclopedia of Japanese People	66	46	23	39	21	5	134	63.5%
2	Encyclopedia of Modern Japanese Literature	42	47	23	43	27	6	146	69.2%
3	A New Version of Comprehensive National Poems	30	47	22	37	14	4	124	58.8%
4	Encyclopedia of News in the Meiji Era	25	47	23	45	37	22	174	82.5%
5	Reference Dictionary of Foreigner	23	47	22	20	8	1	98	46.4%
6	Series of Pandect of Modern Japanese Literary	20	47	23	29	13	1	113	53.6%
7	Series of Full Information	19	47	23	36	24	2	132	62.6%
8	The Complication Pandect of The State of a Country in Showa Era	17	39	17	11	1	1	69	32.7%
9	Encyclopedia for place names of Great Japan	16	47	23	29	8	1	108	51.2%
10	Catalog of Oya Soichi Library	14	47	21	11	4	0	83	39.3%
10	Dictionary of Buddhist Japanese People	14	39	18	12	8	1	78	37.0%
12	Yearbook of Literature	13	46	23	35	22	7	133	63.0%
13	Dictionary of Foreigner in the Modern Era	12	47	23	32	23	3	128	60.7%
13	Encyclopedia of Westerners	12	47	23	27	14	2	113	53.6%
13	Catalog of Translation Book	12	47	23	19	11	0	100	47.4%
16	Encyclopedia of Akita	11	31	4	5	1	1	42	19.9%
17	The Genealogies of the Houses of biographical dictionary in History of Japan	10	44	21	25	19	3	112	53.1%
18	Japan Newspaper Annual	9	46	17	12	2	1	78	37.0%
19	The New Grove Dictionary of Music and Musicians	8	16	2	1	0	0	19	9.0%
20	Encyclopedia of Hyogo	7	38	5	7	3	0	53	25.1%

As we previously mentioned, the records of the Collaborative Reference Database are

registered by various Japanese libraries. The number of records each library registered varies. Some registered many and others few (Tsutsumi et al., 2011). Therefore, one particular library might have registered a particular reference book many times in the records. In such cases, high frequency in the records does not represent general (universal) importance to libraries as a whole. Based on this idea, we focused on the frequently used reference books and investigated which libraries registered them in the reference records. Saitama Prefectural Kuki Library registered 23 times concerning the most registered reference book *Encyclopedia of Japanese People* (n=66 times). The Tokyo Metropolitan Central Library on the other hand registered the second highest frequency of use for the same book but it was just for five time only. Therefore, the high frequency of *Encyclopedia of Japanese People* can be attributed to various libraries, not a specific library (i.e., other libraries registered it 38 (=66 minus 23 minus 5) times in the reference records). *Encyclopedia of Modern Japanese Literature* whose frequency was 42 was the same. The library that registered it the most was Saitama Prefectural Kuki Library and the number was just six. On the other hand, we found two reference books whose frequency could be attributed to specific libraries, i.e. *The New Grove Dictionary of Music and Musicians* and *Encyclopedia of Akita*. The former was used eight times in the reference records and was registered solely by Toho Gakuen School of Music Library. The latter was used 11 times in the reference records and was registered by Akita Prefectural Library eight times. The ratio is 72.7% (=8/11). However, such ratios were less than 50% concerning all the libraries that registered the reference books other than these two. Therefore, we believe that the frequency in the reference records represents the importance (or usefulness) of the reference book for many libraries not a specific library.

### 5.3. Which reference books are cost-effective

Table 4 shows the top 20 reference books whose NPs were the largest. The NP of *Encyclopedia of Modern Japanese Literature* (Nihon Kindai Bungaku Daijiten) was 0.003500, which was the largest among the sample reference books. The value of *Encyclopedia of Westerners* (Rainichi Seyo Jinmei Jiten) was 0.002575, which was the second largest among sample reference books.

Table 4. Top 20 Cost-effective Reference Books

	Reference Books' Titles	NP	Price (YEN)	Number of Being Used in the Reference Records	Municipalities	Ratio
1	Encyclopedia of Modern Japanese Literature	0.003500	12,000	42	146	69.2%
2	Encyclopedia of Westerners	0.002575	4,660	12	113	53.6%
3	The Genealogies of the Houses of biographical dictionary in History of Japan	0.001053	9,500	10	112	53.1%
4	Encyclopedia of Japanese People	0.000919	71,845	66	134	63.5%
5	Dictionary of Buddhist Japanese People	0.000560	25,000	14	78	37.0%
6	Catalog of Translated Literary Work in Meiji, Taisho, and Showa Era	0.000526	3,800	2	73	34.6%
7	Dictionary of Direct Words in Japan	0.000513	7,800	4	144	68.2%
8	Handbook of History of Japan	0.000500	6,000	3	112	53.1%
9	Encyclopedia of Akita	0.000440	25,000	11	42	19.9%
10	Encyclopedia of Nigata	0.000333	18,000	6	40	19.0%
11	Chronological Table of Japan in the Modern Period	0.000273	11,000	3	159	75.4%
12	World History Atlas	0.000267	7,500	2	113	53.6%
13	Dictionary of Foreigner in the Modern Era	0.000250	48,000	12	128	60.7%
13	Encyclopedia of Cultural Anthropology	0.000250	20,000	5	119	56.4%
13	Chijin Shokan Dictionary of Astronomy	0.000250	24,000	6	97	46.0%
16	Techno Atlas of Japan	0.000200	15,000	3	158	74.9%
17	Dictionary of Difficult Reading of a Kanji	0.000172	5,800	1	119	56.4%
18	Yearbook of Literature	0.000156	83,400	13	133	63.0%
19	Dictionary of Secret Language	0.000143	28,000	4	100	47.4%
19	Encyclopedia of Hyogo	0.000143	49,000	7	53	25.1%

## 6. Discussion

As shown in Table 2, the number of city libraries holding *Encyclopedia of Modern Japanese Literature* (Nihon Kindai Bungaku Daijiten) is 43, which means seven (50 minus 43) city libraries do not hold it. The NP of *Encyclopedia of Modern Japanese Literature* is 0.003500, which is the highest among the 77 sample reference books (as shown in Table 4). Its price is

12,000 yen and it is not very expensive. With these, we would like to recommend that seven city libraries purchase it and add it to their reference collections. A similar thing can be said for *Encyclopedia of Japanese People* and prefectural libraries. Although its NP is the fourth highest (0.000919) among the 77 sample reference books, one prefecture (47 minus 46) does not hold it as shown in Table 2.

Among inexpensive reference books, *Encyclopedia of Westerners* (4,660 yen) and *Catalog of Translated Literary Work in the Meiji, Taisho, and Showa Eras* (3,800 yen) have high NPs (second and sixth highest as shown in Table 4). There are many city, town, and village libraries that do not hold them. To improve reference services at low cost, we expect such libraries to purchase these reference books.

## 7. Conclusions

In this study, we have made lists of popular, useful, and cost-effective reference books based on our investigations. The lists contain information about which types of municipality (such as city or village) hold the reference books. We hope that these lists will be used by Japanese public librarians to assess their reference collections and judge which reference books should be purchased (added), considering the type of their library.

We have focused on reference books to improve reference services; however, reference services are now being provided by using online reference tools. Databases and websites, as well as printed reference books, are now popular and effective tools. Some libraries are introducing databases instead of their printed versions. We have to investigate which databases are being introduced in which libraries and compare their frequency of use and price with those of traditional reference books. Through these investigations, we believe that the current status of reference tools in public libraries will be clarified and effective (or at least popular) tools will be identified.

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