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## Availability of Japanese Scientific and Technical Periodicals in Major English Language Databases

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# AVAILABILITY OF JAPANESE SCIENTIFIC AND TECHNICAL PERIODICALS IN MAJOR ENGLISH LANGUAGE DATABASES

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**Keywords:** Databases, Online, Japanese Literature, Japanese Periodicals, Science, Technology.

**Abstract:** In the last decade the number of Japanese scientific and technical periodicals has increased and the realization of the importance of this information has also increased in the Western world. It is thus expected that the number of Japanese periodicals available in English language databases will have increased significantly. To test this assumption, a random sample of titles from the Directory of Japanese Scientific Periodicals was tested for inclusion in eight major English language databases (AGRICOLA, CA SEARCH, COMPENDEX, BIOSIS, EMBASE, INSPEC, MEDLINE, SCISEARCH). Findings show a significant increase of coverage in most databases when compared to the result a similar study conducted in 1979. Language of the periodicals or summaries is the most important determining factor.

## 1. INTRODUCTION

Japan has made a concerted national effort to apply science and technology to achieve economic growth since the end of World War II, and now Japan ranks second as a world economic power in the free world. Japan ranks third in research and development spending in the world and has made the advancement of science and technology a central focus of its national policy (Ref. 1). The collection, analysis, translation, and application of scientific and technical information from all over the world by the Japanese have played a major role in making their economy the second largest in the world.

Japan published 8,900 scientific and technical periodicals 9 years ago. Today, about 10,000 scientific and technical scholarly periodicals are published in Japan. Of these periodicals 20% are published fully or partially in Western languages, with 80% published in Japanese (Ref. 2). As of 1979, the most recent year for which this data is available, only 19% of the Japanese scientific and technical periodicals were included in Western indexing and abstracting printed and database sources. Of this 19%, 71% were fully or partially in English or other Western languages, with only 29% printed solely in Japanese (Ref. 3). Users of English language databases were therefore not being made aware of most Japanese literature.

There are several databases devoted to coverage of Japanese technological literature in 1987. JAPIO database (Japanese Patent Information Organization) provides English language abstracts summarizing Japanese patent applications for which no English language summaries were previously available online (Ref. 4). Japan Technology (provided by the Japanese Technical Information Service, University Microfilms International (UMI)), indexes and

abstracts approximately 600 technological or business periodicals. NewsNet contains the full text of over a dozen Japanese newsletters which cover Japanese business activities. Japan Economic Newswire Plus contains the complete text of news releases from the Japan Economic Daily (JED) and Kyodo English News Service (KENS) newswires. Japanese researchers have access to scientific and technical information from the west through the Japan Information Center of Science and Technology (JICST). JICST collects information related to science and technology, with a collection including 47% domestic periodicals and 53% from the western countries (Ref. 5) JOIS (JICST Online Information System) is an English language version of a database provided by JICST. Since October 1986 it is available in the U.S.

## 2. PROBLEM TO BE STUDIED

In 1987 researchers who know they want Japanese materials can search one of the above databases. If the 1979 situation still exists, researchers who use the traditional subject approach to database selection do not have the same access to Japanese scientific and technical information for their research.

Since 1979, the number of Japanese scientific and technical periodicals has been growing, and realization of the importance of this information has been also growing. It is expected that the number of Japanese periodicals available in English language databases will have increased significantly. My study tested this assumption.

A significant comprehensive study was done on the topic by Gibson and Kunkel at the General Motors Research Library in 1979. The findings were: 1) less than 20% of the Japanese scientific and technical periodical literature is covered by the Western indexes and abstracts, 2) about one quarter of Japan's periodical literature is written in Western languages, yet only about one-half of that literature is available to Western researchers through the indexes and abstracts. Of the 75% that is written in Japanese, only 7% is covered by the indexes and abstracts (Ref. 6).

## 3. RESEARCH DESIGN

To identify the total number of scientific journals currently published in Japan, the Japan National Diet Library's Directory of Japanese Scientific Periodicals was used. It covers 9,569 titles of current serials in science and technology published in Japan as of November, 1984. There are several catalogs and directories of Japanese scientific periodicals, but the Directory of Japanese Scientific Periodicals, 1984 (the most current edition), is the most comprehensive and reliable.

The major English language databases which were surveyed are: 1) AGRICOLA (Bibliography of Agriculture), 2) BIOSIS (Biological Abstracts), 3) CA SEARCH (Chemical Abstracts), 4) COMPENDEX (Engineering Index), 5) EMBASE (Excerpta Medica), 6) MEDLARS (Index Medicus), 7) INSPEC (Computer and Control Abstracts, Electrical and Electronics Abstracts, Physics Abstracts), 8) SCISEARCH (Science Citation Index).

Each database publishes an alphabetic list of periodicals indexed. Each of the randomly selected titles was manually matched against the list for each database.

## 4. FINDINGS

Table 1 shows that approximately 26% of Japanese scientific and technical periodicals are indexed by the major English language databases. This is an increase of about 7% since Gibson and Kunkel's 1979 study. The percentage of Japanese periodicals included in each database is also shown in Table 1. Coverage in AGRICOLA has decreased about 1% since 1979. The coverage in the other seven databases has increased; the coverage in SCISEARCH

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has doubled and that of MEDLARS has more than tripled. This growing percentage of coverage in the databases supports the expectation that the number of Japanese periodicals available in the major English language databases has increased since 1979.

The 370 sampling titles were broken down into four broad subjects: agricultural sciences, applied sciences, medical sciences and natural sciences. The percentage of Japanese titles that are covered in the databases in each subject has also increased since 1979.

Table 2 shows for each subject the percentage of the Japanese scientific and technical periodicals that are included in the major English language databases. Twenty-one percent of the agricultural science, 25% of the applied sciences, 24% of the medical sciences and 35% of the natural sciences titles are included.

#### 4.1 STATISTICAL TEST

Since my sampling size was small and I was comparing the increasing rate of indexing in the major English language databases with the General Motors' study of 1979, the Wilcoxon matched-pairs test was applied. The overall increase is significant at the 0.05 level. Each subject title increase is also significant, except agricultural sciences. Applied sciences shows significance at 0.01, and natural sciences at the 0.05 level. Medical sciences is significant at the 0.05 level, although the total percentage of increase is only 0.1%. This test supports the hypothesis that the total number of Japanese scientific and technical periodicals indexed by the major English language databases has significantly increased since 1979. There has been a significant increase since 1979 especially in the applied sciences. This might show the emphasis that Japan has placed on technological research and the realization by Western researchers that they need Japanese technological information.

#### 4.2 ISSUING ORGANIZATION

Societies publish the largest portion (29%) of total periodicals, followed by government (22%), research institutes (21%) and universities (11%). Almost 90% of government published periodicals are written in Japanese, and only 7% of them have an English or Western language summary. Only 9% of government published periodicals are indexed by major English language databases.

Government publishes the largest portion of agricultural sciences periodicals (46%). Even though the percentage of periodical titles indexed by the major English language databases has increased, the increase is not significant in agricultural sciences. This may be because Japanese do not put much emphasis on agricultural research, and most government publications are statistical reports which are written in Japanese and do not have any English or Western language titles. Western researchers would not be interested in these statistics.

#### 4.3 LANGUAGE AS A FACTOR

Figure 1 shows periodicals indexed by major English language databases broken down by languages. Forty-five percent of the periodicals indexed by CA SEARCH are totally written in English or another Western language. Over 50% of Japanese periodicals written totally in English or in another Western language are indexed by the rest of major English language databases. Figure 2 shows periodicals indexed by the databases broken down by language of summary. Over three-fifths of Japanese periodicals indexed by major English databases have English or Western language summaries. 100% of periodicals indexed in EMBASE have English or Western language summaries, followed by BIOSIS (97%), AGRICOLA (93%), MEDLARS (93%), COMPENDEX (83%), SCISEARCH (83%),



INSPEC (71%) and CA SEARCH (62%). This might show that most database services simply take the English or Western language summary to index Japanese periodicals.

Figure 3 shows that 69% of the periodicals indexed in CA SEARCH are in whole or in part in English or another Western language. Eighty-three percent of SCISEARCH is English or Western language, 86% of INSPEC, 92% OF MEDLARS and 100% of AGRICOLA, BIOSIS, COMPENDEX and EMBASE. This shows clearly that major English language databases index more Japanese periodicals that are written in English or other Western languages than those written in Japanese, and that periodicals with English or Western language summaries are more likely to be indexed by the databases.

That the major English language databases favor English language selection is not surprising. Only one database explicitly states this language bias, however, in its selection criteria. The Bibliography of Agriculture (AGRICOLA) states:

The Bibliography of Agriculture is a monthly index to the literature of agricultural and allied sciences... The National Agricultural Library collects literature related to agriculture from world wide sources. The Bibliography includes citations of journal articles, pamphlets, government documents, special reports, proceedings, ...new serials and, other materials.

Publications are considered for indexing by NAL if a summary, abstract or title is available in a language in which the indexers have expertise...(Ref. 7).

Although language limitations are not stated by the rest of the databases in this study, some selection criteria are used by each indexing and abstracting service. Some criteria may be related to language. As figures 1, 2 and 3 show, three-fourths to 100% of periodicals indexed in the databases are written either completely or partially in English or in Western languages, except CA SEARCH. Chemical Abstracts Service has relationships with many scientific and technical organizations in the world, including the Japan Association for International Chemical Information which provides abstracts of Japanese literature to CAS. This is probably the reason that CA SEARCH indexes more Japanese language periodicals than the other databases.

## 5. CONCLUSION

The results of this study show that language of the periodicals or summaries seems to be the single most important factor that determines whether Japanese scientific and technical literature is included in the major English language databases. Although some Japanese researchers write articles or summaries in English or in Western languages, still half of the Japanese scientific and technical periodicals are completely written in Japanese. Western researchers are not getting access to a large body of Japanese language technical literature. There are translation services available, but they are often perceived as inconvenient or high cost and many researchers do not use these services. This language bias on the part of English language database producers and, perhaps, of the Western researchers means that a large body of the world's valuable scientific and technical literature is not readily available on the Western world.

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DATABASES	'79 STUDY INDEXING of JAPANESE PERIODICALS %	'87 STUDY INDEXING of JAPANESE PERIODICALS %
Total	17.8	25.7
AGRICOLA (AG)	5.3	4.1
BIOSIS (BI)	4.7	8.6
CA SEARCH (CA)	15.4	23.5
COMPENDEX (CO)	1.2	1.6
EMBASE (EM)	2.5	4.3
INSPEC (IN)	2.0	3.8
MEDLARS (ME)	1.1	3.8
SCISEARCH (SC)	0.9	1.6

Table 1. Comparison between 1979 study and 1987 study

#### Agricultural Sciences

DATA	'79	'87
BASES	18.9%	21.4%
AG	13.1	11.4
BI	4.8	10.0
CA	12.3	18.6
CO	0	0
EM	1.1	0
IN	0	0
ME	0.1	0
SC	0.1	1.4

#### Applied Sciences

DATA	'79	'87
BASES	13.0%	25.4%
AG	1.4	2.2
BI	0.3	1.4
CA	10.9	23.2
CO	1.9	3.6
EM	0.3	2.2
IN	2.8	6.5
ME	0	0.7
SC	0.3	1.4

#### Medical Sciences

DATA	'79	'87
BASES	24.0%	24.1%
AG	1.4	0.9
BI	7.1	13.0
CA	20.4	23.1
CO	0	0
EM	10.5	11.1
IN	0.1	0
ME	2.4	12.0
SC	0.8	0.9

#### Natural Sciences

DATA	'79	'87
BASES	23.1%	35.2%
AG	5.7	5.6
BI	9.1	16.7
CA	17.7	31.5
CO	0.5	1.8
EM	0.7	1.9
IN	3.0	9.3
ME	0.2	0
SC	0.8	3.7

Table 2. Subjects in the database

Note AG: AGRICOLA BI: BIOSIS CA: CA SEARCH CO: COMPENDEX EM: EMBASE  
IN: INSPEC ME: MEDLARS SC: SCISEARCH

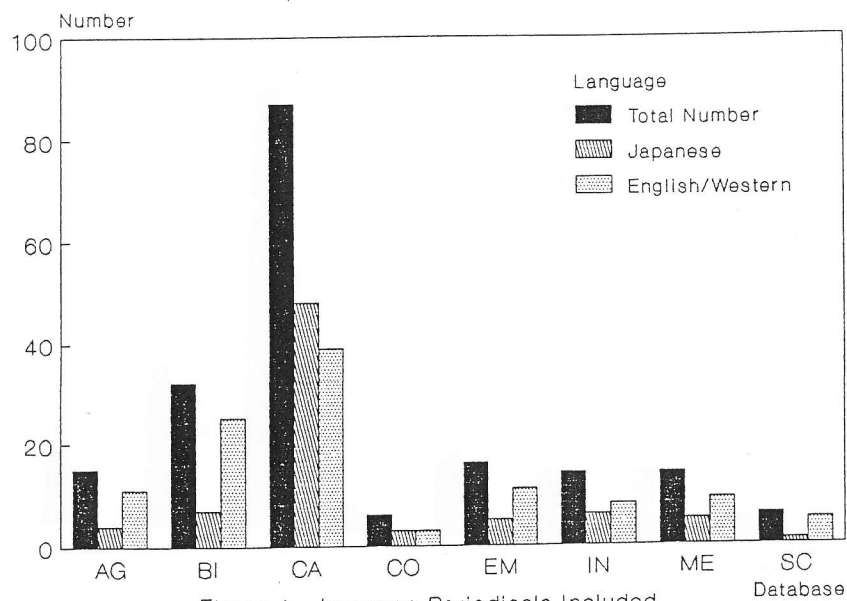


Figure 1. Japanese Periodicals Included in Major English Language Databases by Language (article)

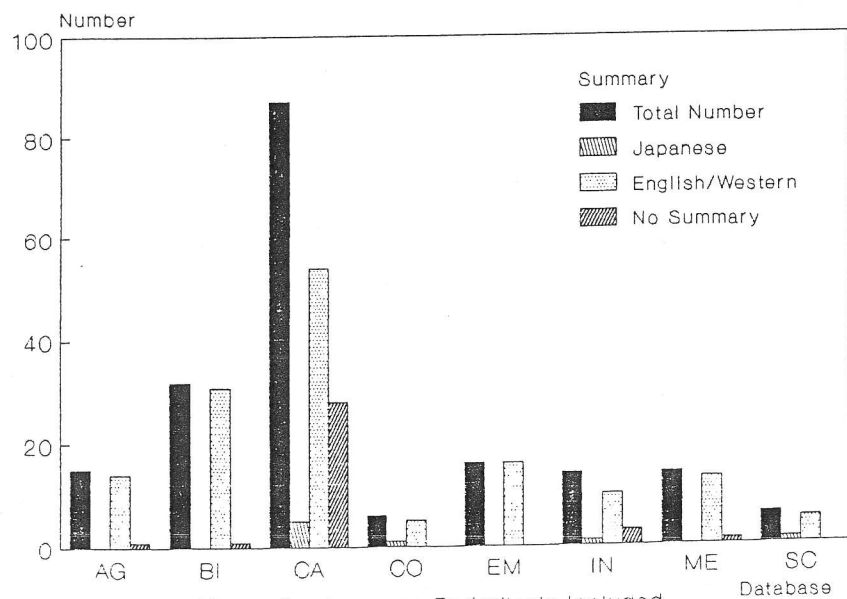


Figure 2. Japanese Periodicals Included in Major English Language Databases by Summary and Language of Summary



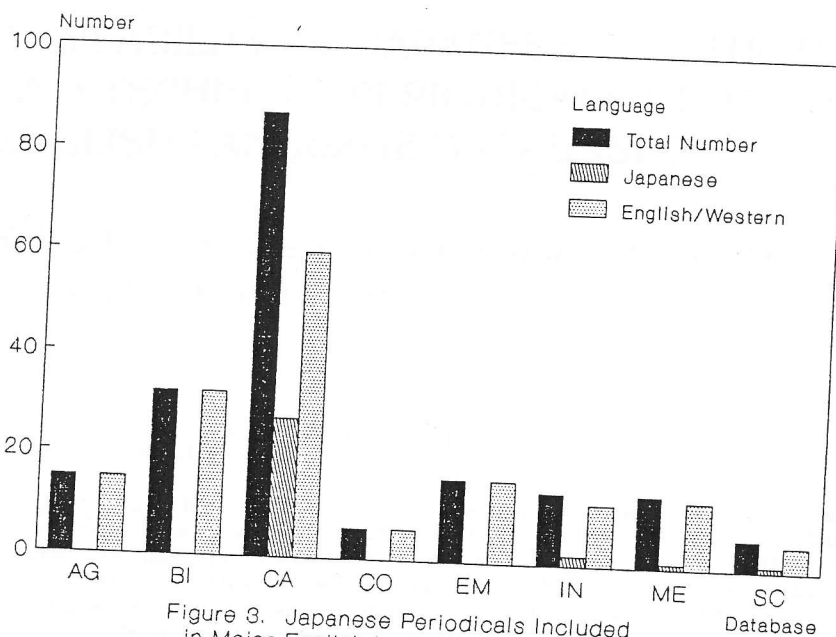


Figure 3. Japanese Periodicals Included in Major English Language Databases by Language (Total: article & summary)

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