Impact of articles in non-English language journals

- A bibliometric analysis of regional journals of China, Japan, France and Germany in Web of Science

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Abstract: In the internationalized process of academic communication of scientific community, English has gradually become the main writing language of scientific communication, and the English-language scholarly publication is the main carrier for academic communication. How's the situation of scientific journals in non-English speaking countries? We select the countries of China, Japan, France and Germany and analyzes the feature of journals in different languages with SCI and JCR data. Journals in different languages have different features. From the perspective of the country, the features of China and Japan are more consistent. Journals in different languages of the two countries have the feature of localization. The features of France and Germany are more similar. The feature of localization is gradually strengthened in English-language journals, Multi-language journals and National-language journals. As to the journal, more local the journal is, more weak the international impact is. However, from the perspective of the fact that journals serve the readers, the publishing model of journal is determined by national input and output of the scientific research. The national scientific achievements need to be communicated in both international and domestic. It's necessary for the journals to take the style of diversification.

Introduction

In the internationalized process of academic communication of scientific community, English has gradually become the main writing language of scientific communication, which can be corroborated by the journal language distribution. By Ulrich's website, there are 34,600+ journals under publishing in the field of science all over the world, and English-language journals has 24,000+, which accounts for 69.19% of the total publishing. English has an absolute advantage in the language of academic publications, and the English-language academic publication is the main carrier for academic communication.

Zitt,M.(1998) pointed that the last decade has witnessed the transition from "National Science Model" to the "Transnational model" in scientific communication and publication. During the transition of the mode, the language of scientific communication and publication activity transforms from national language to English. The phenomenon has been verified by the changes of the Chinese scientific journals in last decade. In 2002, there are only 25 English-

language journals published in China (Zhang, Wang & Lin, 2003). While in 2013, the number is increased to 252, which is 10 times of ten years ago.

At the time English becomes the mainstream in scientific community, the scientists in non-English speaking countries are puzzled by the language expression. The France scholar Vic Norris(2012) wrote the paper "Scientific Globish: clear enough is good enough" in Trends in Microbiology. In his paper, he mentions that writing in English is a problem to many scientists. And the academic community should transform English to the simplified and standardized English, which is easy to learn, easy to use, and easy to academic communications. With the importance of English communication and the trouble of scientists' native language, the academic journal which is the carrier for the academic papers are also facing the same problem. The data stated above indicate the dominant status of English-language journals. Well, what is the status of the journals in non-English speaking countries in the international scientific communication? We choose the journals of China, Japan, France and Germany, which are all non-English speaking countries in SCI database, and analyze the journals in different languages published in non-English speaking country.

Data and overview

The reason for selecting China, Japan, France and Germany is their official language unique. Meanwhile, the amount of journals of these four countries comes on the top of SCI source journals. They have a representation among non-English speaking countries.

The same feature of China, Japan, France and Germany (CJFG) is that they both have National-language journals and English-language journals. And the highest proportion of English-language journals is published by Germany. In terms of the statistics from Ulrich's website, the total number of journals published in Germany is 1844, and English-language journals have 979, accounting for 53.09%. The total number of journals published in France is 659, and English-language journals have 217, accounting for 32.93%. The total number of journals published in Japan is 1619, and English-language journals have 621, accounting for 38.36%. According to Chinese General Administration of Press and Publication, the total number of journals published in China is 4953, and English-language journals have 252, just accounting for 5.14%, which is the lowest. Statistics shows that journal publication in Germany is balanced in language, the publication language features of France and Japan are very similar. National-language journals in both countries account for approximately 2/3, and national language takes dominant place in China.

It's obvious to all that SCI is widely used all over the world. The journal can be acknowledged by more scientists and more likely be cited by more journals if it becomes the source journals of SCI. According to the statistics in JCR 2012, there are 7289 English language journals of 8471 journals, which accounts for 86.04% of the total JCR journals. Therefore, English language journals play an essential role of the global core journals. English has become the main language of scientific communication. What's the status of National-language journals in international communication? We do the further analysis with JCR data.

The article uses the 2010-2012 data of JCR and Web of Science. During the three years, Chinese journals account for 1.7% of all journals in JCR, and the rates of France, Germany and Japan respectively are 2.3%, 6.7%, 2.9%.The rate of the amount of journals in CJFG account with journals embodied in SCI is the same as the rate of English-language journals in the four

countries account with the total native journals publishing.

One of the selection criteria of SCI source journals is that the journals are English full-text journals. "English is the universal language of science. For this reason Thomson Reuters focuses on journals that publish full text in English, or at very least, bibliographic information in English. There are many journals covered in *Web of Science* that publish articles with bibliographic information in English and full text in another language. However, going forward, it is clear that the journals most important to the international research community will publish full text in English. This is especially true in the natural sciences. There are notable exceptions to this rule in the Arts & Humanities and in Social Sciences topics. This is discussed further below. Nonetheless, full text English is highly desirable, especially if the journal intends to serve an international community of researchers. In addition, all journals must have cited references in the Roman alphabet".(The Thomson Reuters Journal Selection Process (http://wokinfo.com/essays/journal-selection-process)

From multiple perspectives, although English journals hold the absolute position, the source journals has the feature of multi-language. During 2012-2013, there are a total of 1190 journals from CJFG in JCR (See Table 1). The feature of multi-language of the SCI source journals is reflected in the language distribution of journals from CJFG (See Table 2). English journals in China, Germany and Japan are in dominant position. Another feature of JCR journals from Germany is that multi-language journals have a high proportion. France has its own outstanding feature, which is that the proportion of English journals, multi-language journals and national-language journals are nearly equal.

Table 1. Year distribution of journals in China, Japan, France and Germany,2010-2012

Country	2010	%	2011	%	2012	%
China	130	1.61%	148	1.78%	143	1.69%
France	189	2.34%	192	2.30%	196	2.31%
Germany	545	6.76%	556	6.67%	563	6.65%
Japan	234	2.90%	240	2.88%	241	2.85%
JCR-Total Journals	8061		8336		8471	

Table 2. Language distribution of journals in China, Japan, France and Germany,2010-2012

Country	2010			2011			2012		
	Eng	ML	NL	Eng	ML	NL	Eng	ML	NL
China	110	3	17	128	3	17	122	4	17
France	58	69	62	61	68	63	63	69	64
Germany	335	127	83	346	128	82	353	129	81
Japan	195	27	12	200	28	12	205	26	10

Note: En: English-language journals; ML: Multi-language journals; NL:National-language journals. The languages are confirmed by JCR.

Analysis on the feature of journals in CJFG

Journal is an academic communication platform. The universality of the source papers

represents the journals' openness of the communication. We can analyze the range of the academic communication with the proportion of the papers by native scientists published in native journals, which tells the difference among different language journals. By retrieving in the Science Citation Index-Expanded（SCI-E）and counting(统计) the native papers in each journal of CJFG during 2010-2012, we can get the average annual percentage of the native papers account in all papers in each journal of each country.

In table 3, China has the highest proportion of native papers published in national-language journals, followed by Japan. The common feature of papers in China and Japan is that the proportion of native papers with total papers is high, which is nearly or over 2/3, no matter what language the journals are in. This shows relatively strong regional feature. The feature of journals in France and Germany is that the proportion of native papers is very low in English-language journals. The proportion of Germany is only 18.22%, which shows the openness of English-language journals is better. The proportion of native papers in native journals of France and Germany is respectively 74.64% and 81.41%. The common feature of CJFG is that National-language journals highlight the characteristic of the country. The Multi-language journals of France and Germany have a significantly different performance with China and Japan. The rate of native papers is lower, which represents diversification.

Table 3. Average annual percentage of native papers in CJFG

Country	En	ML	NL
China	72.89%	87.18%	97.78%
France	25.29%	44.59%	73.64%
Germany	18.22%	37.72%	81.41%
Japan	62.09%	71.64%	80.50%

Will the regional feature shows on the journal impact?

We have a further analysis on the international impact of different journals in languages of CJFG using JCR database. From the year 2003, JCR made journal ranking according to the impact factors in the category. The indicator can be viewed a macroscopic and comparable composition for each journal. The bases of the journal ranking are journal's impact factor and subject attribution of the journal. JCR set up 176 categories. In this article, we use the method of JCR journal ranking and analyze the status of different languages journals in the academic communication.

The journals from CJFG is widely distributed in 176 categories, which is too scattered. For ease of comparison, this article astringes the 176 categories to 22 categories according to the mapping table between 22 categories and 176 categories (ThomsonReuters. List of Fields for Standard and Deluxe Indicators). This is the basis for partition of journals in this article.

The data processing method is stated as following. First, CJFG 1190 journals were confirmed their category. Then sequence in descending order according to the three-year average value of impact factor. The amount of journals in each quartile is 1/4 of the total journals of a certain category. Quartile 1(Q1) has the best performance. By such analogy, Quartile 4(Q4) contains the tail journals of the category. If a journal is belonging to more than one category, we choose the best performance rank of a category. Analysis the journal ranking, we can conclude the journals' degree of recognition in global scientific communication.

Statistically, the journals published in Germany have a good performance on the whole. The quantity of journals in Q1 is close to the one in Q2. There are 246 journals totally in Q1 and Q2, which accounts for 68.72% of all the German journals. The quantity of journals in Q1 and Q2 exceeds the one in Q3 and Q4. In terms of the proportion of journals in Q 1 with total native journals in each country, the rate of Germany, France, Japan and China is 24.96%, 14.38%, 6.8% and 5%.

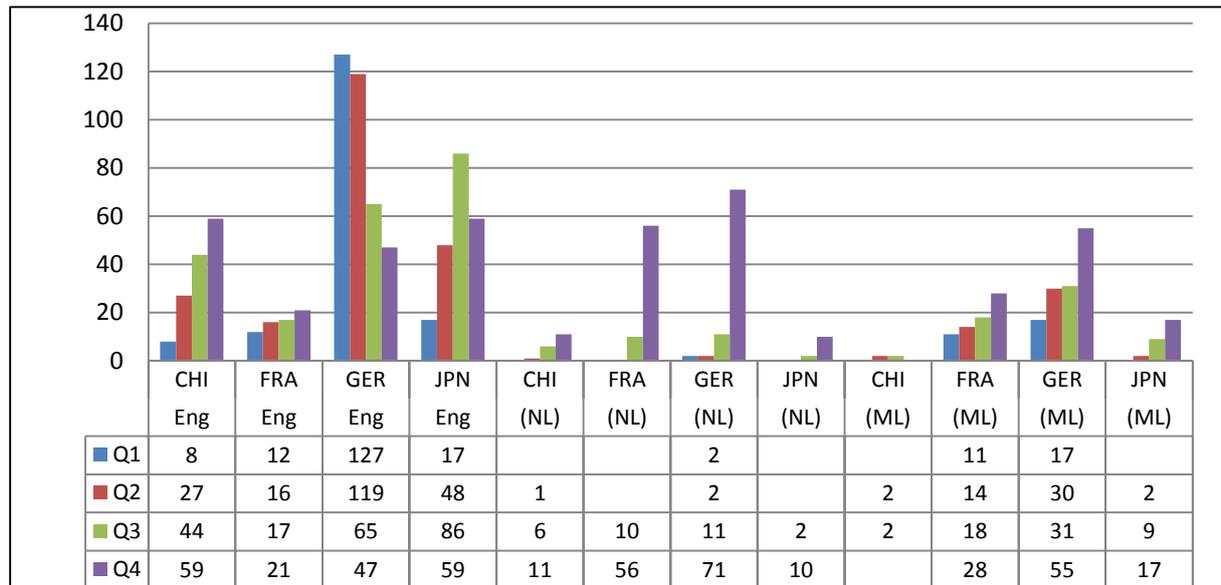|	CHI Eng	FRA Eng	GER Eng	JPN Eng	CHI (NL)	FRA (NL)	GER (NL)	JPN (NL)	CHI (ML)	FRA (ML)	GER (ML)	JPN (ML)
Q1	8	12	127	17			2			11	17	
Q2	27	16	119	48	1		2		2	14	30	2
Q3	44	17	65	86	6	10	11	2	2	18	31	9
Q4	59	21	47	59	11	56	71	10		28	55	17

FIG.1. Q1-Q4 journals number of CJFG

From the feature of language, the English-language journals distributed in Q1 is better than multi-language journals and national-language journals. Obviously, English-language journals of the four countries are all distributed in Q1. In these four countries, the amount of English-language journals in Germany is in descending order in Q1-Q4 subareas. The amount of English-language journals in France distributed in Q1 is least. But the journals distributed in the four subzones is relatively balanced. The journals of China and Japan distribute rarely in Q1, but the journals distributed in Q2-Q4 subarea are in majority.

In the distribution of multi-language journals subareas, France, Germany and Japan have few or no distribution in Q1, but concentrate in Q4. There are only 4 journals of China distributing in Q2 and Q3. As with the expanding of the subareas, the journals' amounts of each subareas are increasing. The distribution of national-language journals are less unsatisfactory. Only Germany has 2 journals in Q1, which is just 2.32% of all the journals in German. The data shows that national-language journals are mainly concentrated on Q4.

According to the regional distribution of the impact factors, the data of English-language journals are better than the data of Multi-language journals and National-language journals for each country. And the subareas of Multi-language journals have an advantage over the National-language journals to some degree. National-language journals of each country concentrate in Q4 apparently, which indicates the impact of National-language journals has some limitation. The impact is decreasing from English-language journals to Multi-language journals then to National-language journals. From the view of data, we have to admit English

takes an important place in the scientific communication.

Quartile 1-4 of Impact factor show the impact degree of journals from one side. We will have a further analysis on the difference in impact of journals in different languages from the component of the impact. The analysis is based on two indicators which are self-citation rate of journals and citation correlation coefficient of native papers.

In recent years, the journal community pays high attention to journals' self-citation. ThomsonReuters (http://wokinfo.com/essays/journal-self-citation-jcr) believes the journal whose self-citation is over 20% is regarded over excessive self-citation according to the statistics on the citation data. In terms of the statistics on journals' self-citation rate offered by JCR, there are a total of 206 journals whose average self-citation is over 20% in 3 years (see Table4) for these four countries, which accounts for 17.32%. In the light of absolute number, Germany has 91 journals whose average self-citation in 3 years is over 20%. On basis of the percentage of journals whose self-citation is over 20% of the total native journals, the highest rate is produced by China which is 29.38%.

TABLE 4. The journal quantity of each country whose average self-citation rate>20% in 3 years

Journal-Lanuage	China	France	Germany	Japanese
Eng	32	7	29	18
ML	2	8	20	2
NL	13	28	42	5
Sum	47	43	91	25
Ratio	29.38%	21.18%	15.77%	10.00%

Note: Ratio represents the amount of journals whose self-citation rate exceeds 20% accounts of the amount of journals in each country.

The journals' over self-cited phenomenon in Germany and France concentrates on multi-language journals and national-language journals, accounting for 68.13% and 83.72% separately of the total national over self-cited journals. The common feature of China and Japan is that the over self-cited journals are concentrated on national English-language journals.

The self-cited rates of national-language journals from CJFG are outstanding. China has 13 national-language journals whose self-cited rates are too high, accounting for 72.2% of the total national-language journals. The proportion of France, Germany and Japan is 42.42%、 48.84% and 41.67% separately. There are two main reasons for the over self-rated phenomenon. On one hand, the human factors may affect. On the other hand, the international influence of the national-language journals is more limited than the English-language journals. The total citation frequency of national-language journals isn't high, so the self-cited rate must be relatively high.

The source papers of academic journals are global. The influence of a journal in academia is affected by the internationalization feature of the component of editors and source papers. There are more than 8000 journals in JCR, publishing the papers of scientific researchers around the world. During 2010-2012, researchers in Germany, France and China published papers in 6200~6800 journals, and researchers in Japan published papers in 5900 journals. The journals publishing papers of these four countries account for 80% of all the journals in JCR. Currently the data basis used to explain the journals' impact indicators come from the cited times

contributed by citing journals. How is the influence of the citing journals that publish papers of various countries on the native journals' citation frequency? To illustrate this problem, we conduct the experiment on data statistics.

We analyze the component of the citing journals in CJFG. Although 1190 journals belong to different disciplines, and referencing behaviors are distinguished in different disciplines, there still exist a common phenomenon, which is that few citing journals have high citing frequency. According to this feature, we choose 1190 journals in JCR, and select the citing journals whose citing frequency belongs to TOP20 and select the citation frequency. It should be noted that with the JCR rules of data presentation, when the journal's citing times is lower than a certain threshold, the specific citing journal and its citing frequency should be represented by "All Others". If the citing times of "All Others" belongs to TOP20, it won't be counted in the calculation process in this article. Therefore, some journals only have 19 citing journals in TOP20 actually. Another case is that some journals' citing journals are less than 20. The article ignores the two cases and refers to TOP 20 collectively.

During 2010-2012, 1190 journals has 63,353 records of TOP20. We retrieve the published papers of CJFG in 2008-2012 in SCI-E database, and get the journal list of each country. Then match the journals where the papers are published with the TOP 20 journals. And we can get 1190 journals with their citing journals' citing frequency and the amount of papers from China, Japan, France and Germany in the citing journals. In data matching, there are 3636 records of citing journals not in SCI-E database. It is verified that they are the source journals of SSCI or PICI. So there are 59717 valid records actually. The data about the paper whose citation year is previous two years. Namely if the citation year is 2010, the amount of the paper includes papers published in 2008-2009. If the citation year is 2011, the amount of the paper includes papers published in 2009-2010. The data make up the relationship shown in table 5.

Table5 Example of Relationship between citation frequency of the citing journals and the amounts of papers

Citing Year	Nation	Cited Journal	Citing Journal	Citing times	Amout of papers published previous 2 years
2010	China	J1	Citing_j1	100	20
2010	China	……	…	…	…
2010	China	J1	Citing_j20	200	90
2011	France	J60	Citing_j1	200	30
2011	France	J60	Citing_j20	500	100

Each journal has the data about citation frequency of citing journals and the amount of the papers. Using the two matched groups of data, we can calculate the correlation between published papers of a country and the journal's cited times of the country. Correlation coefficient is calculated with the Person formula, and results are shown in table6.

Table 6. Correlation coefficient table for paper and its amount in CJFG

Nation	Language	R2010	R2011	R2012
China	Eng	0.64	0.63	0.69
	Multi-Lang	0.67	0.69	0.69

	National-Lang	0.64	0.67	0.70
France	Eng	0.64	0.66	0.66
	Multi-Lang	0.49	0.46	0.43
	National-Lang	0.74	0.76	0.72
Germany	Eng	0.58	0.53	0.59
	Multi-Lang	0.56	0.55	0.57
	National-Lang	0.64	0.59	0.66
Japan	Eng	0.68	0.66	0.66
	Multi-Lang	0.49	0.46	0.43
	National-Lang	0.70	0.61	0.59

From the view of journals in different languages, National-language journals have a strong correlation between cited times and amount of native papers. The correlation coefficient of CJFG is about 0.65. But the correlation coefficient of France is above 0.7 in 3 years, which shows stronger correlation. As to the journals in Multi-language journals, the correlation coefficient of China is above 0.67, which shows strong correlation, followed by Germany whose correlation coefficient is above 0.5. The correlation coefficient of France and Japan is lower than 0.5, which shows slightly weaker correlation. English-language journals have a strong correlation between cited times and amount of native papers for each country. China, France and Japan show the consistency, and correlation coefficient of Germany is slightly lower. According to the data , the citation of National-language journals has a greater relationship with native papers, which fits in high percentage of native papers and high self-citation rate of National-language journals and indicates the limitation of native language on international impact.

As to the correlation of the journals in three types of language between citing times and native paper, there are other factors which shouldn't be ignored, such as wide distribution of the papers in JCR journals for each country, inheritance and continuity of the achievements made by native scientific research community, greater international cooperation in scientific research, increase in international collaboration on research papers (The Royal Society,2011). All these factors strengthen the amount of papers in citing journals during the process of calculating the correlation coefficient. So if there are real cited data of native papers, and the nationality signed on the papers are distinguished, it should be better to explain the extent of the native papers' contribution to the citing behavior, then it will further illustrate the international influence of journals in different language.

Conclusion and discussion

Through analyzing journals in different languages in CFGL, we can get the conclusion that journals in different languages have different features. From the perspective of country, the features of China and Japan are more consistent. Journals in different languages of the two countries have the feature of localization. The features of France and Germany are more similar. The localization is gradually strengthened in English-language journals, Multi-language journals and National-language journals.

1. English-language journals have an advantage over the Multi-language journals and

National-language journals about the international impact for each country. In the quilter distribution of impact factors, English-language journals of each country are distributed in Q1. Excessive self-cited journals are fewer. China and Japan has a higher percentage of native papers in English-language journals, which is over 60%.

2. The Multi-language journals of China and Japan are fewer. The feature of Multi-language journals in France and Germany is that the amount of native papers is more than the ones of English-language journals. But the proportion is still less than 50%. The impact of Multi-language journals is weaker than English-language journals. In the subarea distribution of impact factors, Multi-language journals are concentrated in Q3 and Q4. Excessive self-cited journals are increased. Correlation between citation frequency and the amount of native papers is weak. It can be speculated that Multi-language journals meet the needs of multi-language readers and authors. The multi-language journal has the transnational and interstate feature, while its readers are limited. The feature of localization is not obvious, but the impact is weaker than English-language journals.

3. The feature of localization is more obviously for National-language journals .The proportion of native papers is nearly or over 80% of the total. Excessively self-cited journals are focused on National-language journals. Citation rate has a strong relationship with the amount of native papers, which fully reflects the limitation of the localization feature of the journals.

The positions in the international scientific communication of journals in different languages tell English-language journals play the leading role in scientific communication. Mintomo Yuasa discovered the transferring law of scientific center in 1962. Since 1920, the world scientific center is transferred from Europe to America. According to the statistics from SCI, the papers from America have been top of the world all along, and English has been the main language of scientific communication. In Zitt. M and others' research findings, it turns out that the English-language journals' publications are increasing rapidly. Other languages withdraw from the main position gradually, becoming regionalized and localized languages of communication.

The data about journals in different languages from CJFG shows that China and Japan have relatively strong localization feature no matter in distribution of the papers or journals' influence. The localization feature of journals from Germany and France isn't so obvious. On the basis of Wikipedia statistics (http://en.wikipedia.org/wiki/List_of_languages_by_number_of_native_speakers), we can explain this phenomenon with the language distribution. Chinese possesses the largest number of users. But the main distribution areas concentrate on the territory of China. Japanese is limited to the native Japan. Although French is the official language of France, but the users are all through the world, which is the intercontinental language just next to English. Though Germany is focused on the use in Europe, but Germany has the feature of multinational use. Meanwhile, several researchers also believe the scientific center is not unique. England, Germany, France, Japan and other countries are also important geographic distribution of scientific research (Yuan J Y, 2005). So the value of scientific research achievement has close relation to language diversity. From the view of language distribution feature, the amount of the languages users isn't the decisive factor. The global multiregional distribution, and the environment of scientific communication are relatively important factors. Multi-lingual

publishing of Germany and France proves. The regional limitation of Chinese and Japanese makes the journals' influence limited in native scientific environment objectively.

The nature of journals is carrying the scientific research achievements, and playing the role of spreading and training. Because the scientific researchers are from different countries, so the existence of multi-language journals has its inevitability. If the target of the journal is to improve the international influence, the journal has to be published in English, and the source papers should be global, which forms the international academic exchange platform. If the target is to serve the authors and readers, the native language and multi-lingual journals are also publishing modes, which meet the native authors' need, and spread the scientific achievements to wider academic community by exchanging ways in multi-lingual. China, Japan, France and Germany published Chinese-English, Japanese-English, French-English, French-Spanish, German-English etc. multi-lingual journals. Maybe this is the good way to improve the international influence of national-language journals or multi-lingual journals.

With the push of internationalization and globalization, some countries emphasize on citing the papers from "research central countries", rather than the papers from their own country. In the journal publication, some small countries publish their journals only in English (Kirchik, O., Gingras, Y. & Lariviere, V.,2012;Gingras, Y.,2009). But what measurement will the scientific research superpower countries take? The publication model of a country is determined by many factors, such as the input and output for scientific research, rewards from journals and so on. A country's research outcomes don't only need to be communicated internationally, but also need to be disseminated internally. So the development of journals should take the road of diversification.

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