



Toward internationalization: A bibliometric analysis of the social sciences in Mainland China from 1979 to 2018

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ABSTRACT

The past 40 years have witnessed profound changes in the international competitiveness of Mainland China's scientific research. Based on publication data from Chinese researchers in the Social Sciences Citation Index (SSCI) from the Web of Science (WoS), this study aims to provide a bird's-eye view of how social science research in Mainland China has internationalized over the past four decades. The findings show that the number of social science articles published by Chinese authors in international journals has experienced a noticeable increase, and the collaboration networks of researchers from Mainland China have broadened, with the number of articles with a Chinese first author showing a strong upward trend. In addition, findings show that Chinese scholars are published in a wider range of journals, and there has been a steady increase in their appearance in higher impact journals (influenced in part by certain journals). Finally, different social science disciplines show various degrees of internationalization. This study provides a broad view from which to examine the internationalization process in Mainland China's social science landscape in the last four decades, while also noting some of the possible explanations for these changes, thereby deepening our understanding of social science research stemming from the region.

1. INTRODUCTION

The era of reform inaugurated by Deng Xiaoping in 1978 and Mainland China's subsequent opening to the outside world has led to rapid advances in China, particularly in the areas of economics, education, science, and technology. Mainland China has been recognized as one of the leading nations for scientific research due to the "exponential growth" of its publication output (Foland, 2010; Jin & Rousseau, 2004). As part of this development, internationalization—the exchange of information and intellectual collaboration across national boundaries—has emerged as a distinctive component in Mainland China's emergence as a pacesetter in scientific research. Internationalization is "an essential part of the path that social knowledge must walk in order to become truly scientific" (Boncourt, 2018). Indeed, internationalization is important not only for ensuring research quality and the development of specialization (Sivertsen, 2016) but also for enhancing the prestige, visibility and competences of the country, institution or individual (Altbach & Knight, 2007). However, local orientation in research is important as well. The social sciences would lose their *raison d'être* and support from society by

disconnecting from the surrounding culture and society to mainly communicate in international journals that are only read by peers abroad (Sivertsen, 2016). The social sciences not only study culture and society but may also collaborate with, influence and improve culture and society in domains such as economic and social development, policy design, public administration, legislation, education, sustainable urban and rural life, media and information, international affairs, and global understanding. Hence, internationalization and local relevance in the social sciences should not be seen as opposed to each other, but as a question of a dynamic balance (Sivertsen, 2018). This article focuses on the process and characteristics of internationalization as a dynamic balance over time in Mainland China’s social sciences.

There are three interconnected levels (reflected in Figure 1) at which the process of advancing internationalization can be observed.

In a broad sense, the meaning of internationalization may include three levels—national, institutional, and individual level. At the national level, there are various policies and research programs that encourage and support scientific research that crosses international boundaries. At the institutional level (e.g., universities), internationalization can be promoted through foreign-language instruction, exchanging and/or teaching international students, constructing faculty teams with international backgrounds, etc. At the individual level, it can involve collaborating and publishing internationally, seeking academic recognition abroad, being active in international research organizations and conferences, and research stays in secondary affiliations abroad.

The use of the research framework in Figure 1 will require a wide range of document studies and statistical data that are partly only available at the local level. However, scientific publications in themselves contain useful information about various aspects of internationalization in knowledge production, and these are highlighted in the lower part of Figure 1. Cited references represent the knowledge base of the study. The authors may have affiliations (published addresses) in different countries, and the topic of the study may be more or less relevant across countries. Some journals are more international than others with a worldwide representation of

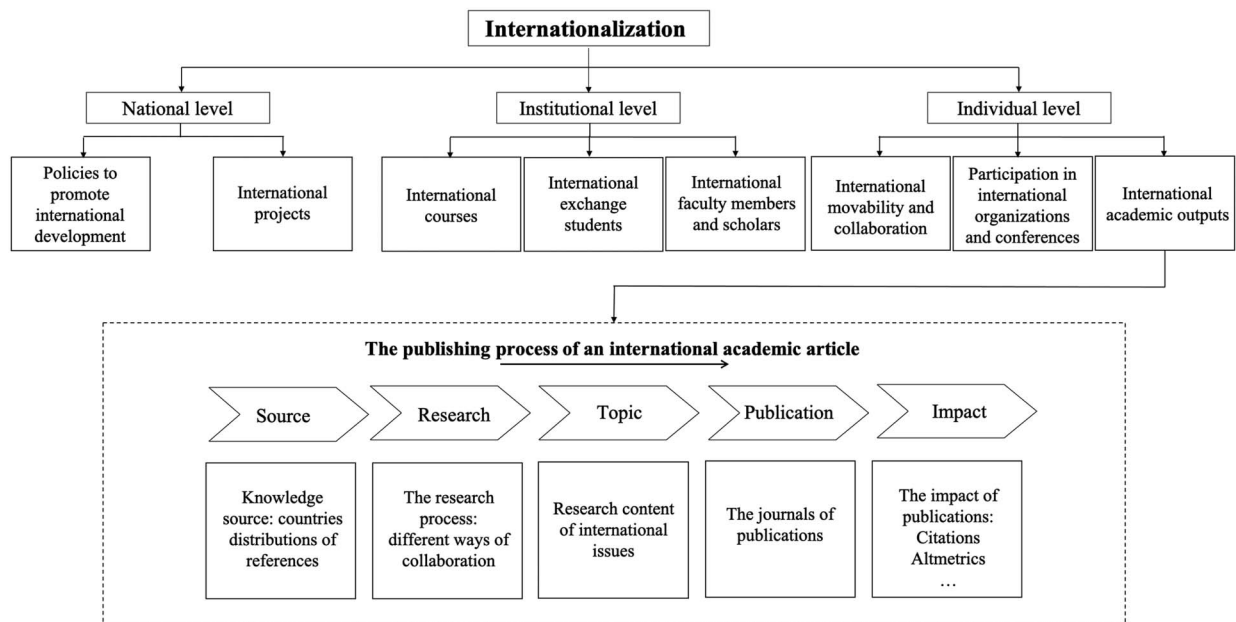


Figure 1. The research framework for internationalization of scientific research.

authors. The publication itself may achieve a broad citation impact across countries. Bibliometrics can be used to capture such aspects of internationalization. The source of knowledge for an article (to what extent the literature sources come from different countries), the process of the research (whether there is international collaboration expressed as coauthorship), where the article is published (in international or domestic journals), and the impact of the research (to what extent publications receive citations from the international community) can all be investigated through bibliometrics. As a first step in systematic research, the current study focuses on investigating internationalization from the perspectives of international collaboration and journal information.

It should be noted that in Mainland China there are striking differences in the degree of internationalization between the natural sciences and the social sciences. The remarkable gains that research in the natural sciences has enjoyed in Mainland China over the past four decades have been well documented (Basu, Foland et al., 2018; Jin & Rousseau, 2005; Wang, 2016). This is partially attributable to the fact that the objects of study in the natural sciences are usually universal, which is convenient for international academic communication. In contrast, the phenomena of the social sciences are typically embedded locally, as described above, and the obligations towards local relevance may often lead to a lack of international relevance and influence. In addition, Chinese social scientists face difficulties when participating in the global arena owing to cultural differences and language barriers (Yang, 2013). Our study will show that Mainland China still has far to go to raise the level of internationalization of its social science research.

Mainland China has only recently become internationally visible in social science research, with significant growth in research outputs and more frequent cross-border communication and collaboration (Li & Li, 2015). On this background, we focus on the internationalization of Mainland China's social science research for the following reasons. First, in the past 40 years, Chinese universities have developed their international connectivity and competitiveness around the world. China's universities are being reshaped by a series of "excellence initiatives," including "Project 211," "Project 985," and "Double First-Class." These excellence initiatives, among other policy contexts, have profoundly advanced the internationalization of Chinese researchers' academic communication and outputs (Rhoads & Hu, 2012). Internationalization has been adopted as one of the major strategies by elite Chinese universities to meet national targets for world-class status (Mohrman, 2008; Xie, 2018; Yang & Welch, 2012).

Second, while Mainland China is renowned as a large and influential contributor in the natural and technological sciences, the standing of its social sciences is still an underresearched area. It remains unclear whether Mainland China has also risen to the same level of global influence when it comes to the social sciences (Liu et al., 2015).

Finally, several new research policies related to social science research have been launched in China during recent decades. As an example, the Chinese government issued its "Opinions on Further Prospering the Development of Philosophy and Social Science" in 2004, which spelled out a roadmap for the internationalization of social science and humanities research in Mainland China¹. In our study, we will relate our observations of the development of Mainland China's social sciences to the relevant policy contexts over time.

Most of the existing studies seek to answer some variants of the research question "Is China becoming a 'giant' in social sciences?" Several responses have drawn on bibliometric analyses. For example, Zhou, Thijs, and Glänzel (2009) charted the evolution and citation impact of

¹ http://www.gov.cn/test/2005-07/06/content_12421.htm. The term "philosophy" refers to the humanities in general.

China's publication activity in the social sciences and concluded that "China has not yet taken off in the internationalization of social sciences" (p. 615). Liu, Hu et al. (2015) similarly concluded that China is still not a major player in the social sciences with regard to the number of Chinese journals indexed in SSCI and the number of globally recognized researchers. There have also been a series of studies investigating the development of China's social sciences from the perspective of specific disciplines (Wang, 2011; Zhang, Xu et al., 2018).

Apart from the observations reported in the previous literature (Liu et al., 2015; Zhou et al., 2009), this study focuses on a thorough analysis of the long-term internationalization process (1979–2018) in Mainland China's social science research from a comprehensive bibliometric perspective. Our four specific research questions are

1. What are the overall and periodic development trends in the internationalization process for social science research by Chinese researchers? How can international and local publication trends be explained in light of Mainland China's research policies to promote international development?
2. What role does international collaboration play in internationalization? Are Chinese authors increasingly taking the first-author role in international collaboration articles in social sciences?
3. Are more social science articles involving Chinese authors published in high-impact journals? What role does the rapid development of open access (OA) in publication activities play in this process?
4. What differences exist concerning the above questions with respect to the different social science disciplines?

2. DATA AND METHODOLOGY

2.1. Data Source

This study takes articles indexed in SSCI as the data source for the analysis of internationalization. In addition, Chinese articles indexed in CSSCI (Chinese Social Sciences Citation Index)² are analyzed for comparison with domestic publishing. Limitations of the SSCI data should be mentioned. The heterogeneity of the scholarly publication patterns in the social sciences includes not only journal articles. Books and articles in books are also often used for publishing research in the social sciences (Sivertsen, 2016). Further, journal articles have limited coverage in the SSCI in several social science disciplines (Aksnes & Sivertsen, 2019). In addition, as a result of the proliferation of interdisciplinary researches, many studies sit between the natural and social sciences. Some articles indexed in SSCI are also related to social sciences. Despite the limitations, compared to other data sources and for the feasibility of international comparisons across disciplines and countries, SSCI contains the core body of international literature along with stable long-term coverage. Furthermore, as a vehicle for scholarly communication and collaboration within the international academic community, articles published in international journals do play a vital role in the internationalization of most disciplines. Therefore, we selected publications indexed as "Article" in SSCI within the years 1979–2018 as the original data sample. The total number of publications from all countries is almost seven million.

² CSSCI (<https://cssrac.nju.edu.cn/a/cpzx/zwshkxwxy/>) is a citation index database in Mainland China. It was developed by Nanjing University in 1997 and was established in 2000. This citation database covers about 500 Chinese academic journals in the humanities and social sciences.

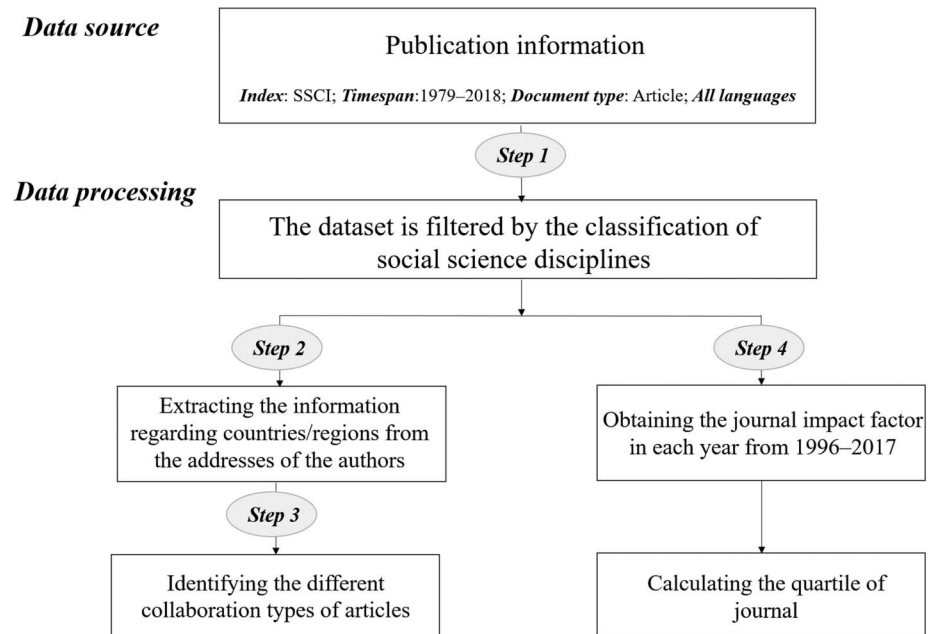


Figure 2. Data source and processing for the internationalization analysis.

2.2. Data Processing

2.2.1. The classification of social science disciplines

The data source and processing procedures are indicated in Figure 2. Although SSCI mainly indexes journals in the social sciences, it contains some journals that are also assigned to natural sciences categories. All journals in our data set were, therefore, additionally filtered by the ECOOM classification (Glänzel & Schubert, 2003; Glänzel, Thijs & Chi, 2016). Only journals that were assigned to one of the six ECOOM social sciences fields were kept for further investigation. Furthermore, taking the large share of psychology journals and publications in SSCI into consideration, a “Psychology” field was added in addition to the original ECOOM classifications of the social sciences³. Therefore, the social sciences referred to in this study include academic articles that belong to these seven social science field classifications: *Business, Economics, Planning; Community & Social Issues; Education, Media & Information Science; Law; Political Science & Administration; Psychology; and Sociology & Anthropology*. The matching relation between the above social science field classification and WoS journal categories (WCs) is listed in the Appendix. There were 5,036,181 publications available after filtering. We refer to these publications as “social science articles” to differentiate from the original whole data sample indexed in SSCI (almost seven million). For specific disciplinary analysis, a full-count assignment scheme has been applied for publications with multiple disciplinary classifications.

2.2.2. Identifying country/region from the author’s address

The country/region information is extracted from the author’s institutional address, which is included in the publication’s bibliographic information. For the purposes of this study, we separated Mainland China from Hong Kong, Macao, and Taiwan. These jurisdictions have very different scientific research systems. Among all the authors of a publication, as long as at least one of the authors’ institutional address is located in Mainland China, the publication is included

³ This new classification corresponds with the 11 WoS categories (WCs) that are related to psychology.

in the data set of Mainland China. We could thereby assign 49,109 publications to Mainland China. The same assignment approach is applied for other countries (the United States, the United Kingdom, and Japan) for comparative analysis.

2.2.3. The different collaboration types of articles

To conduct an in-depth analysis of collaboration, we classified the publications by collaboration type. In this study, we defined that noninternational collaboration articles (N-ICA) are written by researchers with addresses in the same countries, and international collaboration articles (ICA) are written by researchers with addresses in different countries. Specifically speaking, based on the institutional addresses of the authors of the publications, noninternational collaboration articles (N-ICA) are those where all the listed affiliations are located in Mainland China. International collaboration articles (ICA) list one or more affiliations in another country. Note, however, that we did not classify Hong Kong, Macao, or Taiwan as “another country.” There is a small group of articles (8.16% of the data sample) with combined affiliations in Mainland China, Hong Kong, Macao, and Taiwan. These articles are not included in the ICA and N-ICA categories, but are analyzed separately.

To investigate the role of Chinese scholars in international collaboration, we then further divided the set of ICA articles according to the first author’s affiliation. The order in which the authors’ names appear generally reflects the contribution that each author made to the article (Egghe, Liang, & Rousseau, 2003), with the first author typically playing a lead role in the research and writing process (Larivière, Desrochers et al., 2016). Articles in which the first author is affiliated with a Chinese institution are categorized as Mainland China-led ICA. Articles in which the first author is affiliated with another country are categorized as Other-led ICA⁴. (We used the corresponding author information where first author data was missing.) Figure 3 summarizes the different types of collaboration.

2.2.4. The calculation of journal quartiles

For the analysis from a journal perspective, we calculated the journal quartiles according to journal impact factors for each year from 1996–2017⁵. Although the Journal Citation Reports (JCR) website provides journal quartiles for each year and discipline, its data are difficult to download in bulk from the JCR website. Our study is based on long-term large-scale data, and therefore we chose to calculate the quartiles ourselves using the journal impact factor data.

Two steps were required for calculating journal quartiles. First, subdata sets were created of journals in each year of every WoS category (WC) and then ranked within each subdata set by journal impact factor in decreasing order. The percentile value of each journal was computed as $100 \times i/n$ (where n and i indicate the number of journals and the rank value, respectively). The resulting quartiles were designated Q1 (0–25%), Q2 (25%–50%), Q3 (50%–75%), and Q4 (75%–100%). We did not calculate quartiles for subdata sets containing less than four journals. In cases where a journal belonged to more than one WC, we used the best quartile result of that journal in that year.

3. RESULTS

The results are presented in three subsections, focusing on different dimensions of Mainland China’s social science research publication performance from the perspective of internationalization. In the first subsection, we discuss Mainland China’s social science publication track

⁴ There are two reasons for taking first author rather than corresponding author as the basis of classification: Compared with corresponding author, first author is more frequently used or recognized in social sciences, and research evaluation in Mainland China in general favors attributed “first-author” contributions.

⁵ Journal impact factor data have been available for downloading since 1996.

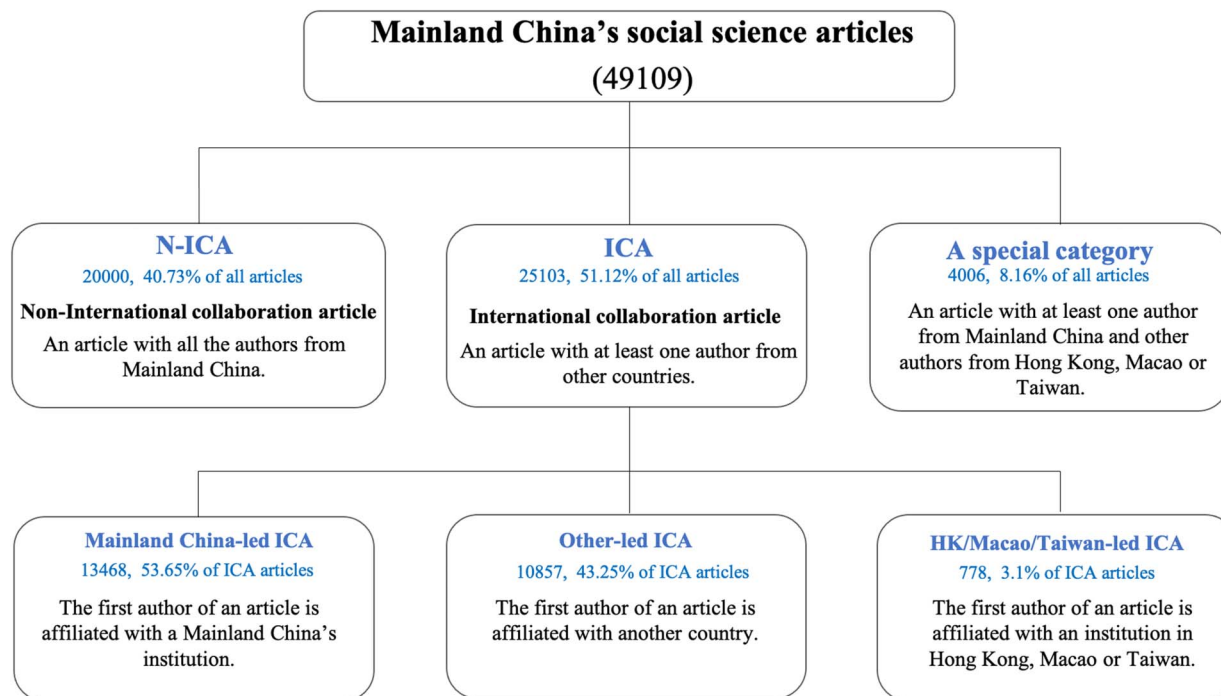


Figure 3. Different types of collaboration articles.

record in terms of general performance. We compare with selected countries and add Chinese articles indexed in CSSCI for a domestic comparison. In the second subsection, we investigate international collaboration in Mainland China's social sciences, including general collaboration trends and the distribution of disciplines, and investigate collaboration networks across continents, regions, and countries. The final subsection focuses on international journals in which Chinese researchers have published, including the quartile distribution of international journals, as well as some details related to disciplines and collaboration types. A discussion of OA journals is also included in the last section.

3.1. The Emerging Internationalization of Mainland China's Social Science

In this subsection, we focus on the development trends in Mainland China's social science research, with a comparative analysis of international and domestic articles. To understand the differences between how social sciences have developed in Mainland China as opposed to other countries, we chose to compare with three developed nations, the United States, the United Kingdom⁶, and Japan. Chinese articles indexed in CSSCI were also added to the picture to help understand the relative role of internationalization within Mainland China.

3.1.1. General trends

Figure 4 shows the number and annual growth of social science articles indexed by SSCI from Mainland China.

Two observations are clear: International articles rarely occurred with a strongly fluctuating annual growth rate prior to 1998. More recently, Mainland China's researchers have been

⁶ The United Kingdom includes England, Scotland, Wales, and Northern Ireland.

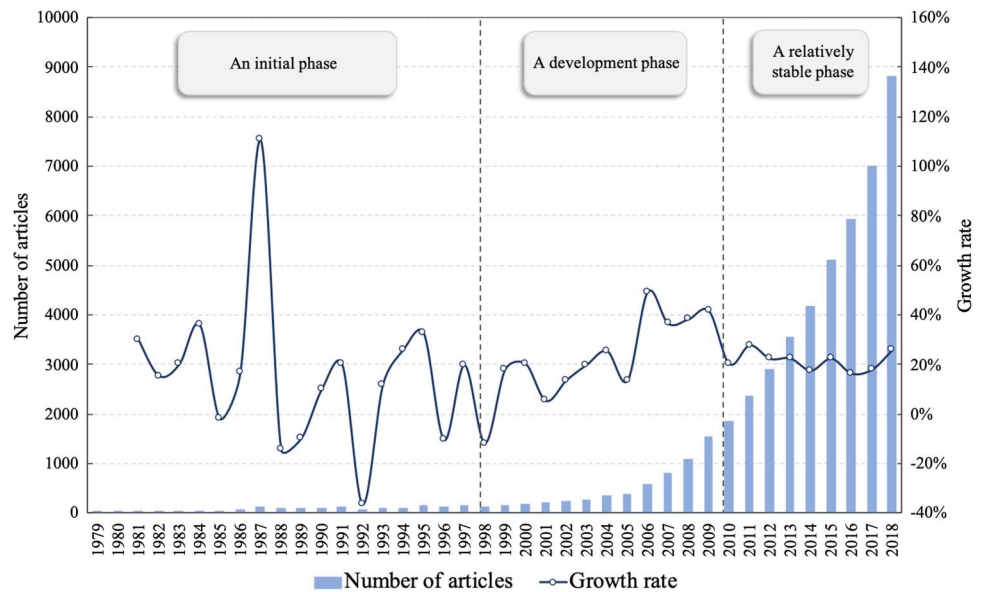


Figure 4. Phases in the evolution of Mainland China’s international social science articles in SSCI (1979–2018)⁷.

publishing significantly more articles internationally while the annual growth rates have stabilized (around 20%). As mentioned in Section 1, a policy was issued by the Chinese government on promoting the international development of social sciences in 2004, and it may have contributed to the increasing growth rate of Mainland China’s social science articles indexed in SSCI around 2005. We observe three different evolution phases of Mainland China’s social science research—initial exploration, development, and relative stability.

3.1.2. International comparison

As Figure 5 shows, the world share of social science articles from the United States has maintained roughly the same 25%–30% over the last decades. Moreover, the world shares of social science articles from the United Kingdom and Japan have shown relatively steady growth. In contrast, there is a noticeable growth in Mainland China’s share, especially in the last decade. The number of publications for each country was calculated on the basis of a full counting scheme.

3.1.3. Domestic comparison

The above comparison shows a significant growth of international articles in Mainland China’s social sciences compared to three other countries. This may be regarded as a sign of increasing internationalization. However, this trend needs to be contrasted with the indigenous practice of academic publishing in Chinese social science to get the full picture.

Similar to SSCI, the CSSCI is a citation indexing database based on a selection of relatively prestigious journals in the humanities and social sciences, but it only includes journals published in Mainland China. These journals are highly recognized in Mainland China, and they publish a

⁷ The growth rate in 1980 is 300% due to the excessively small number of articles in 1979 and relatively large variation in 1980. Therefore, this particular case is not shown in Figure 4.

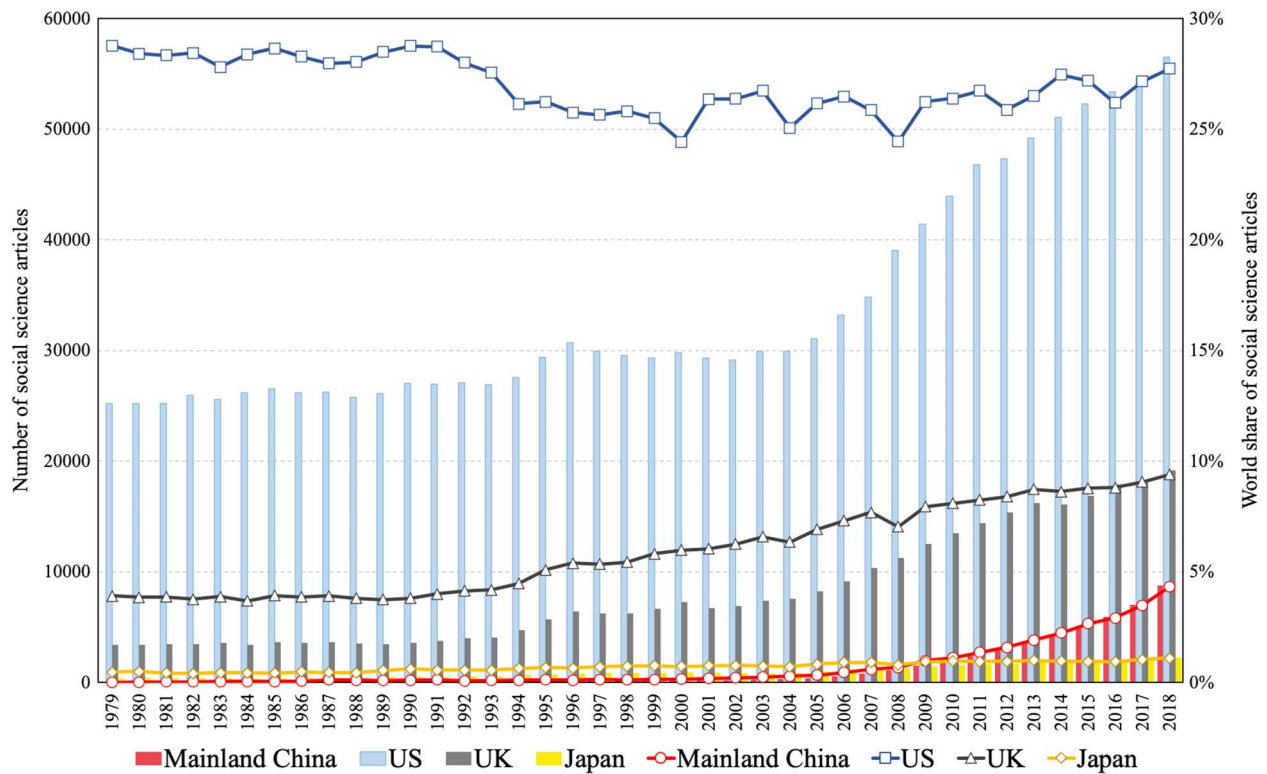


Figure 5. The number and world share of social science articles of Mainland China, the United States, the United Kingdom, and Japan (1979–2018).

representative portion of the local articles in Mainland China’s social science fields⁸. The annual number of social science articles indexed in CSSCI and SSCI is shown in Figure 6.

Figure 6 shows a decline in social science articles indexed by CSSCI after 2010. This trend can be compared to, and perhaps explained by, the increasing trend of social science articles indexed by SSCI from around the same time. However, local journals are still publishing the bulk of social science publications by Chinese researchers. The number of CSSCI articles are nearly 25 times that of SSCI articles during 1999–2018. Although the proportion of SSCI articles relative to the total has been increasing over time, it only accounted for 14% in 2018. Mainland China’s world share in Figure 5 is also very low compared to the situation in natural sciences, where Mainland China is now the largest contributor in the world to international journals (Tollefson, 2018)⁹. We can conclude that even with a high and stable growth rate recently, internationalization is not yet a dominating trend in Mainland China’s social science. Compared to eight non-English speaking European countries where data representing domestic publishing in the social sciences is available as well (Kulczycki, Engels et al., 2018), the share of articles published internationally from

⁸ The classification of social science disciplines in CSSCI is different from that of SSCI. Here, we choose similar disciplines, including *management, economics, political science, law, sociology, ethnology, journalism and communication, library, information and literature, education, sports science, statistics, psychology, general theory of social science, and military science.*

⁹ We note that China and the United States’ position as “the largest contributor in the world to international journals” depends on the data source and the counting methods for international collaborated publications (Sivertsen, Rousseau, & Zhang, 2019).

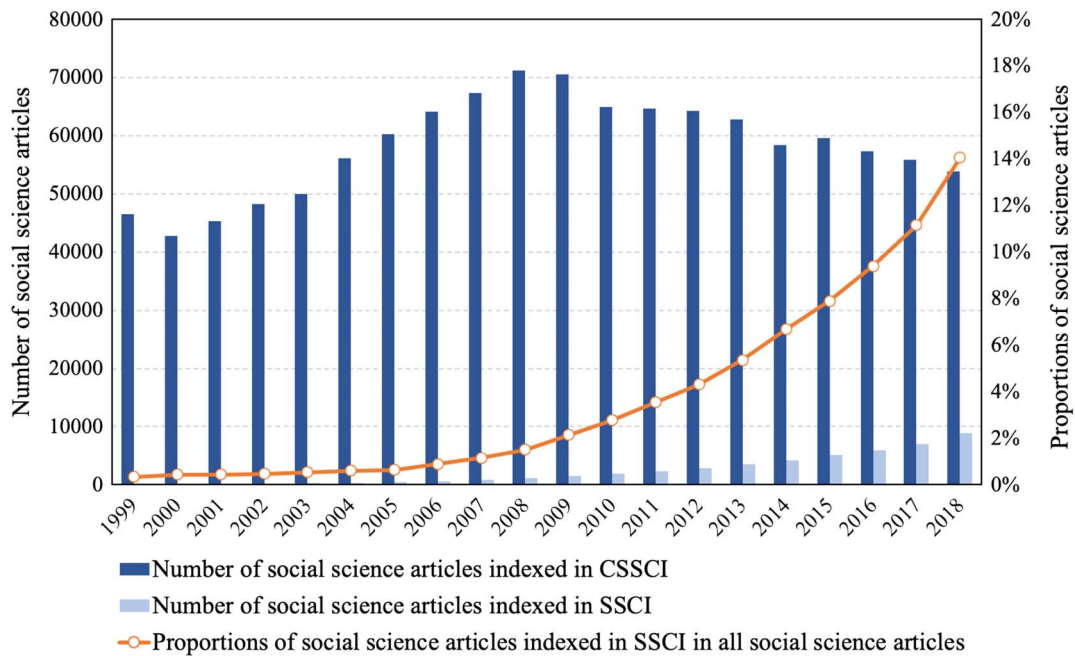


Figure 6. The number of social science articles indexed in CSSCI and SSCI (1999–2018)¹⁰.

Mainland China is lower than in Central and Eastern Europe (around 25%) and much lower than in Western Europe (around 50%).

The trends reflected in international articles and domestic articles may demonstrate how Mainland China has so far dealt with the dynamic balance between internationalization and localization (Sivertsen, 2018). The process of internationalization is evident, but localization is still dominating. Both have their own merits and defects. The term “localization” refers to social science research that is based on domestic circumstances and practices and oriented towards serving local needs. As mentioned before, it is part of the *raison d’être* of the social sciences to be useful for local culture and society. Publishing in specialized journals on the international level is necessary to be confronted with and inspired by scholarly standards, critical discussions, and new developments among other experts in the field (Sivertsen, 2019). Obviously, localization also means limited international visibility, influence and gains from international collaboration. Not only the wish to be locally relevant but also the influence of cultural differences and language barriers may strengthen localization and inhibit the development of a dynamic balance. Some researchers see localization and internationalization as opposed to each other: The internationalization of academic production will potentially jeopardize the development of local knowledge (Li, 2016; Yang, 2015), and there is a dilemma of publishing globally and perishing locally or publishing locally and perishing globally (Hanafi, 2011). Yet the relation between internationalization and localization need not be antagonistic. The balance can be dynamic and monitored with comprehensive data (beyond international databases), enabling both localization and internationalization without just defending status quo or only focusing on one of the strategies (Sivertsen, 2019; Zhang, Zhao et al., 2020).

The more recent policy of Mainland China for its social science research is not only “go global,” (Ministry of Education of the People’s Republic of China [MOE], 2011) but also “publish

¹⁰ As the CSSCI database started providing data in 1999, the comparative analysis in this section begins from 1999.

your best work in your motherland to benefit the local society,” as a call proposed by President Xi in 2016¹¹. This orientation towards local needs for research and local publishing has been reinforced recently in a new policy of the Ministry of Education (MOE) and Ministry of Science and Technology (MOST) (MOE, 2020; Ministry of Science and Technology of the People’s Republic of China [MOST], 2020). The new policy specifies that “in principle, when researchers provide representative publication lists, papers from domestic journals should account for at least one-third of all the publications” (MOST, 2020). The new policy has aroused intense discussion in China as well as immediate interest internationally. According to Zhang and Sivertsen (2020), the specific “one third” criterion might work as a general policy aim but needs to be applied with differentiation according to field and type of research and the purpose of communication.

The balance between globalization and local relevance needs to be empirical and dynamic, that is, reflecting a statistically informed policy for reasonable change (Sivertsen, 2018). To be statistically informed, the policy needs data sources and indicators for documenting and measuring the use of language for all the different purposes in research. An example would be to combine the two data sources used in this study (SSCI and CSSCI) and extend them to other data sources representing the communication of the social sciences with Chinese society. The development could then be monitored, and the policy could be made dynamic by using this comprehensive information for a discussion of reasonable change; for example, to what extent is the “one third” criterion promoting a reasonable balance between local relevance and global participation in each social science field?

As shown in Figure 6, the annual volume of domestic articles indexed by the CSSCI is still much higher than that in SSCI. If not balanced with a strategy for internationalization as well, Chinese social science may not prosper from the gains from internationalization. Therefore, localization should not be an obstacle to internationalization, but a resource for social science from Mainland China to gain a place in the international academic arena.

3.2. International Collaboration

In the era of “big science,” collaboration has become one of the primary ways to combine and organize resources into a superior platform for research (Price, 1963). The increase in joint international papers signifies an increase in scientific collaboration across national boundaries and offers an important area for bibliometric exploration (Luukkonen, Persson, & Sivertsen, 1992). In this section, we look at the intersection of collaboration and internationalization in Chinese social science research articles, including general collaboration trends and how collaboration is distributed across disciplines, countries, and continents.

3.2.1. Trends of international collaboration

Figure 7 (left panel) shows that in the early years, most social science articles indexed by SSCI only involved authors from Mainland China. International collaborations have increased steadily over time, and a slight increase in the proportion of N-ICAs is observed in recent years. As shown in Figure 7 (right panel), at first, the majority of those collaborations were led by researchers in other countries. More recently, Chinese scholars have increasingly taken the first-author role. After a clear shift in 1998, the proportion of Mainland China-led ICAs has sharply increased, while the proportion of Other-led ICAs went into decline. This could be a sign that Chinese researchers are taking a more active role in research collaboration, but some of the explanations might be a policy with preference and monetary incentives only for first-author articles in China

¹¹ See http://www.xinhuanet.com/politics/2016-05/31/c_1118965169.htm.

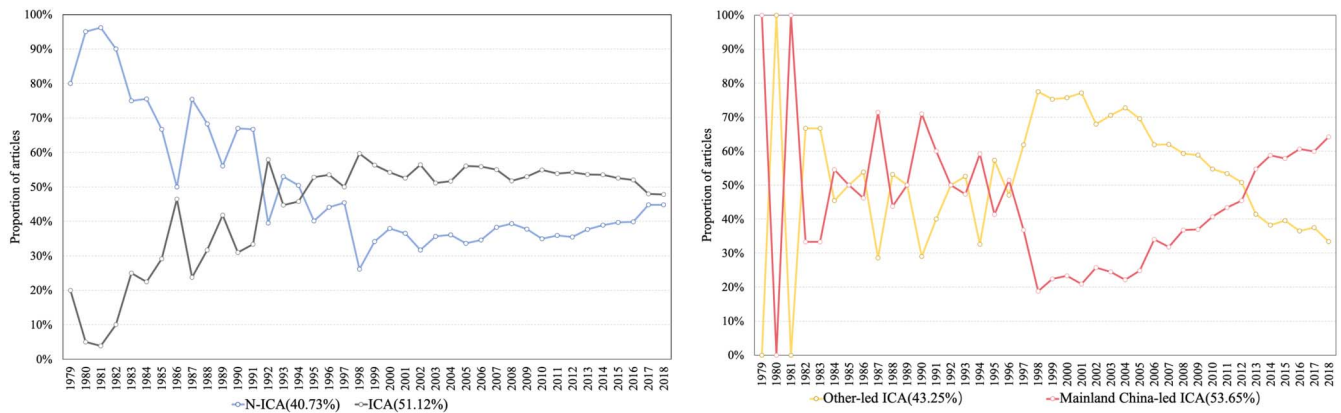


Figure 7. The trends of articles of different collaboration types in the social sciences in Mainland China (1979–2018)¹².

(Quan, Chen, & Shu, 2017). Furthermore, the recent increase in the overall proportion of N-ICAs also indicates that an increasing number of Chinese scholars publish articles in international journals independently of international collaboration.

3.2.2. Discipline distribution

The degree and forms of international collaboration differ across social science disciplines. We investigated and counted the proportion of ICAs and Mainland China-led ICAs in each discipline, as shown in Figure 8.

ICAs in *Business, Economics, Planning, Psychology, and Sociology & Anthropology* account for more than 50% of all SSCI articles in the corresponding discipline, indicating that international collaboration is more widespread in these disciplines. The higher proportion of international collaboration in these disciplines may reflect more use of internationally shared quantitative research methods, data, experiments, and division of labor among collaborators, and these results also correspond well to different degrees of international publishing in social science fields in general (Sivertsen, 2016). The disciplines with low international collaboration and relatively more Mainland China-led articles (*Education, Media & Information Science; Community & Social issues; Law; Political Science & Administration*) are also in most cases those that are more localized in their choice of topics and general publication patterns in other countries (Ossenblok, Engels, & Sivertsen, 2012).

3.2.3. Country distribution

We divided the period of study into four timespans (1979–1998, 1999–2008, 2009–2013, and 2014–2018) to show the evolution of international collaborations and to identify the collaborating countries in each timespan¹³. For a holistic picture of international collaboration in Mainland China’s social science research, countries were grouped according to their respective continents

¹² The calculation of the proportions of N-ICA and ICA is based on all articles, while the calculation of the proportions of Mainland China-led ICA and Other-led ICA is based on international collaboration articles.

¹³ As shown in Figure 4, the development of social science research in Mainland China can be divided into three distinct periods: 1979–1998, 1998–2010, and 2010–2018. Here, the periods are further divided into 1979–1998, 1999–2008, 2009–2013, and 2014–2018 for deeper analysis.

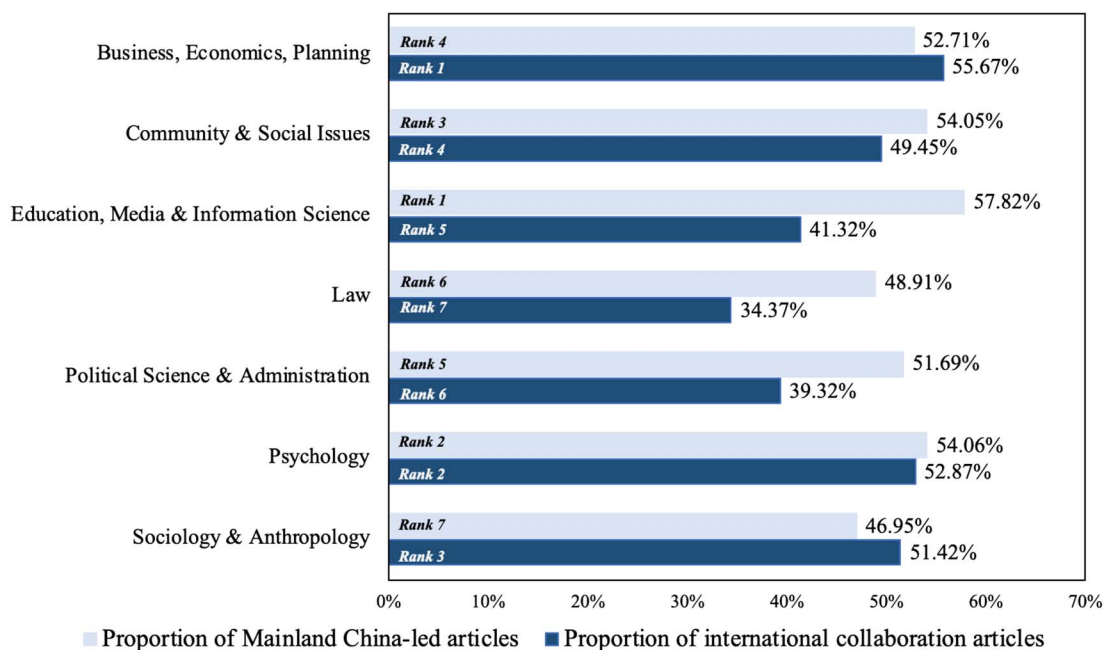


Figure 8. The proportion of ICA and Mainland China-led ICA in each social science disciplines from Mainland China (1979–2018)¹⁴.

and a separate region was created for Hong Kong, Macao, and Taiwan. The evolution of international collaboration with Mainland China is shown in Figure 9.

On the whole, the number of countries collaborating with Mainland China is increasing. The number of countries and regions increased from 41 in the first period (1979–1998) to 126 in the fourth period (2014–2018). More specifically, a notable increase in Mainland China’s international collaboration with other countries and regions in Asia can be observed. Regionally influencing factors such as geopolitics, history, language, and cultural similarity seem to be very important for collaborative networks, as observed in other studies (Luukkonen et al., 1992). In addition, there is also a clear growth of collaboration articles between Mainland China and Europe. Not only have the number of collaboration articles risen significantly, but the proportion of collaboration articles has also increased over time, reflecting growing research links between Mainland China and Europe. As a contrast, the overall proportion of collaboration articles between Mainland China and North America shows a decreasing trend, from 69.53% in the first period (1979–1998) to 54.09% in the fourth period (2014–2018). North America was an important collaboration area in the early stages of the internationalization of Mainland China’s social science research, but Mainland China’s international collaborations have expanded and diversified significantly with the growth of international collaborators from around the world.

In terms of the collaboration periods, the greatest expansion of the number of collaboration countries and regions is seen in the second period (1999–2008), from 41 in the first period (1979–1998) to 90 in the second period (1999–2008). Further, the largest increase in the number of collaboration articles is also found in the second period (1999–2008), where it increased by 2.7 times compared to the first period. These observations may reflect that 1999–2008 was a turning point for expanding international collaboration in the social sciences in Mainland China, but it

¹⁴ The calculation of the proportion of ICA is based on all articles, while the calculation of the proportions of Mainland China-led ICA is based on international collaboration articles.

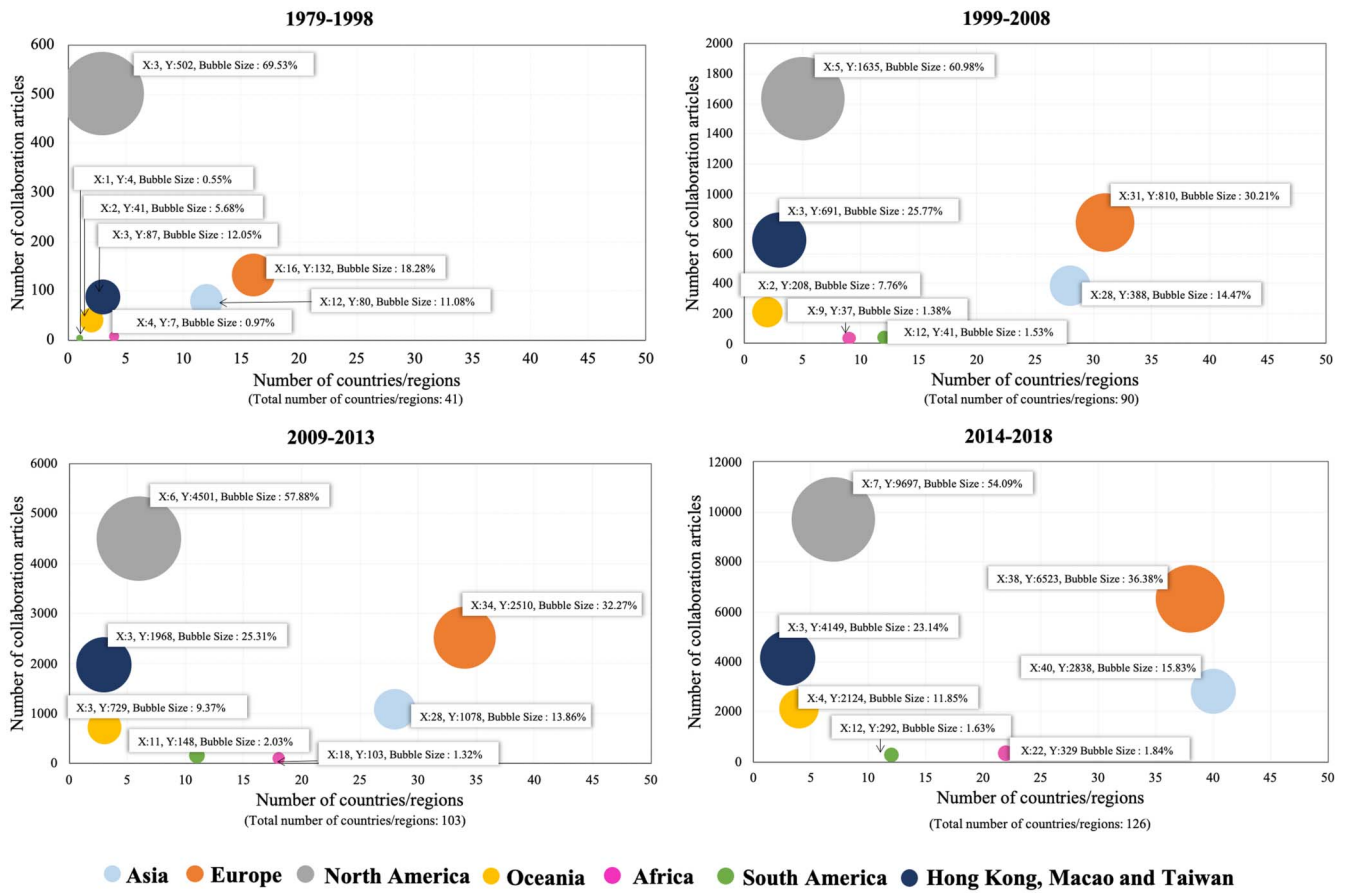


Figure 9. Collaborations with Mainland China during each period (1979–2018)¹⁵.

might also reflect an increasing worldwide interest in social science research on topics relevant for China and Chinese collaborators.

3.2.3.1. Collaboration networks To visualize the evolution of Mainland China’s collaboration networks in the social sciences, we map Mainland China’s collaboration links using Salton’s index (r_{ij}) to measure the strength of copublication links (Glänzel, 2001; Salton & Bergmark, 1979; Zhou et al., 2009). Salton’s measure can be defined as:

$$r_{ij} = \frac{p_{ij}}{(p_i \times p_j)^{\frac{1}{2}}}$$

where p_i is the number of publications of country i , p_j is the number of publications of country j , and p_{ij} is the number of joint publications. The higher the Salton index, the stronger is the observed collaboration intensity. The change in Mainland China’s scholarly cooperation can then be visualized by maps (see Figure 10).

¹⁵ X indicates the number of Mainland China’s collaboration countries and regions; Y indicates the number of Mainland China’s collaboration articles; bubble size indicates the proportions of all collaboration articles.

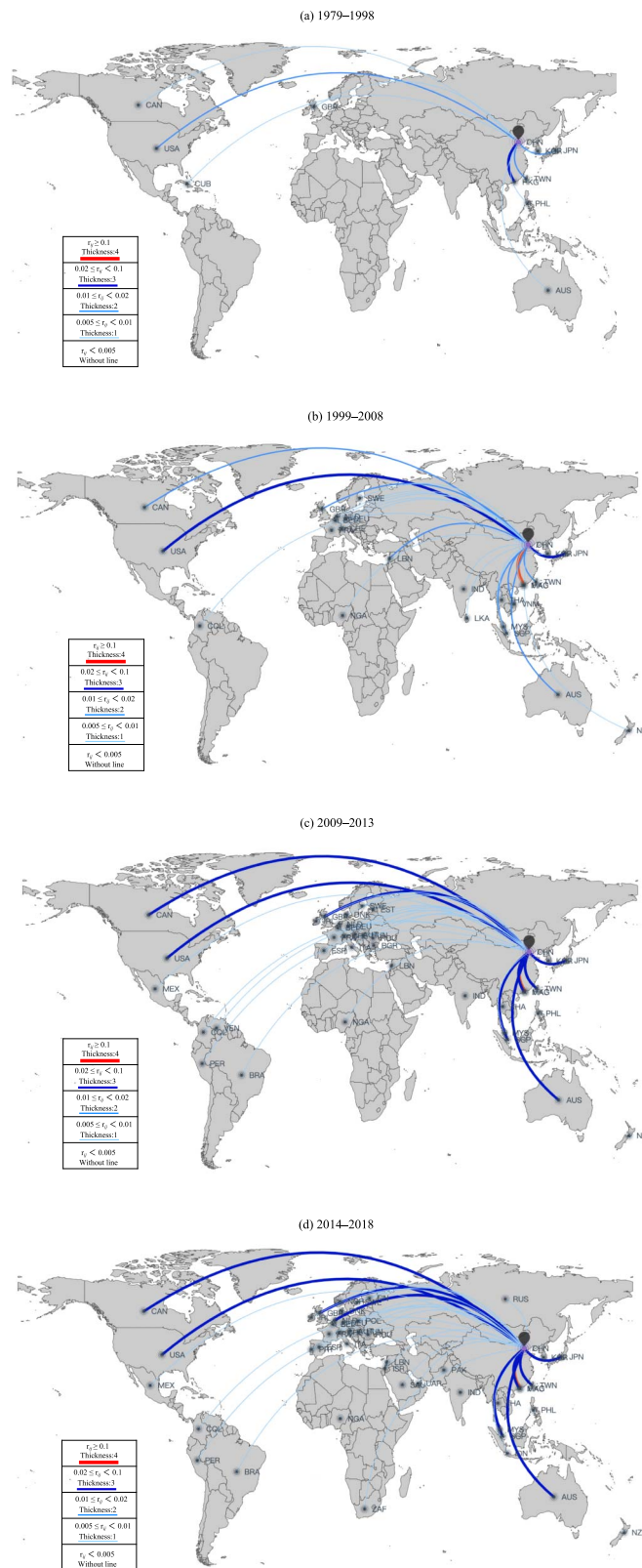


Figure 10. Social sciences collaboration map for Mainland China during each period based on Salton's measure (1979–2018).

Figure 10 clearly illustrates the changes in the collaboration networks over time, from being relatively sparse to gradually increasing in intensity. The visualization confirms the observation made in Figure 9 that the second period (1999–2008) is an important period for Mainland China to expand and broaden international collaboration. A significant change in the intensity of international collaboration is manifested in the third (2009–2013) and fourth (2014–2018) periods. These two periods seem critical for deepening international collaboration relations in the internationalization process of Mainland China’s social science research.

3.2.3.2. Collaboration partners with high intensity A coauthorship analysis at the country/region level could reveal which countries/regions are particularly important for collaboration. In most cases, frequent coauthorships reflect active collaboration between partners. Two indexes are generally used in coauthorship calculations: collaboration frequency and collaboration intensity. We used the proportion of the number of articles that the two countries share as a measure of collaboration frequency and we measured collaboration intensity (i.e., the strength of the connection) with the Salton index. Figure 11 depicts the top 10 countries/regions with the strongest intensity of collaborative articles with Chinese scholars in each period, as well as the proportion of collaboration articles of corresponding countries/regions.

As shown in every panel of Figure 11, Mainland China and the United States clearly hold an important bilateral relationship in social science research. Collaborations between the two countries account for the largest proportion of all international collaborations by Chinese authors, which demonstrates the important role that the United States plays in the internationalization of Mainland China’s social science research. The strong connection between the two largest

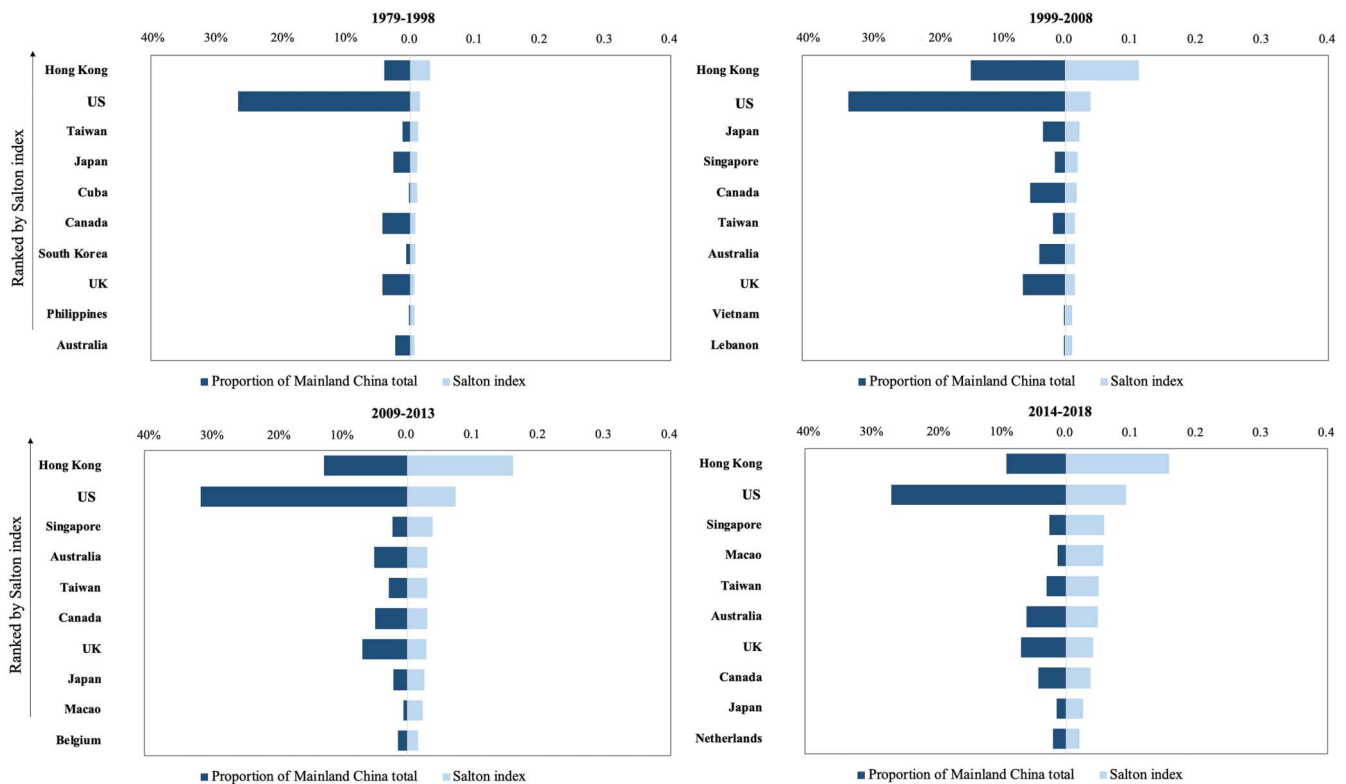


Figure 11. Country/Region-level coauthorship ranking for each period (1979–2018).

rivals for global science leadership has also been broadly reported (e.g., Mallapaty, 2018; Woolston, 2019). In this process, Chinese students and scholars who study and work in the United States, and also those returnees, can be an important factor in facilitating collaborations between China and the United States (Jin, Rousseau et al., 2007). It is noticeable, however, that there has been a slight decrease in the proportion of joint articles, from 33% in the second period to 27% in the fourth period. Given how slight the change is, it is difficult to determine if the importance of the United States to Mainland China's internationalization process is declining. However, as the overall number of Mainland China's collaborations with other countries/regions is growing, it is clear that internationalization is still important for Chinese scholars, just not necessarily with the United States. Further, the collaboration intensity between Mainland China and the United States is relatively weaker than that of Hong Kong in all four periods. The United States is the largest contributor to social science research worldwide and maintains collaborations with many countries/regions. In this context, Mainland China is only one of many collaborators to the United States. This may partially explain why the collaboration intensity between Mainland China and the United States is less pronounced.

As mentioned above, collaboration with Hong Kong has the strongest intensity throughout all four periods. This is perhaps unsurprising, as Hong Kong has historically played an important bridging role between Mainland China and other nations. Similarly, Taiwan and Mainland China have maintained strong research relations, which is indicative of the influences that history, politics, and culture have on scientific collaboration relations.

Interestingly, Japan was an essential partner to Mainland China in the early stage of the internationalization process. However, in later periods, there has been a noticeable decrease in the proportion of collaborations between the two countries, and correspondingly the intensity of the collaborations has weakened. This might be explained by the Japanese government's findings in its *2018 Science and Technology White Paper*, which concluded that Japan's scientific and technological competitiveness was being eroded by a decline in young researchers, stagnant growth in R&D funding, and a decrease in the number of high-impact articles (Ministry of Education, Culture, Sports, Science and Technology, 2018). In addition, more than two dozen Japanese universities have announced that they will reduce or altogether eliminate their academic programs in the humanities and social sciences, which may be indirectly causing the decrease in social science research in Japan (Jenkins, 2015). In parallel with Japan's waning importance, Singapore has gradually become a more active Asian partner to social scientists in Mainland China over the period.

Other important countries for Mainland China's collaboration network include the United Kingdom, Australia, and Canada. These countries have helped to advance Mainland China's internationalization process, and their presence in Mainland China's collaboration network also indicates a general broadening and deepening of global collaborations in line with Mainland China's opening-up policy and associated reforms.

3.3. International Journals

International journals are essential mediators through which we can analyze the internationalization of Mainland China's social sciences because their published articles are important external manifestations of the process. International journals can also be viewed as important for Chinese scholars to be visible internationally and gain the best resources and quality standards from international collaboration. This section therefore explores the internationalization of Mainland China's social science research through international journals, including investigating how articles are distributed among journal quartiles, disciplines, and collaboration types. We will also have a closer look at OA journals, because some of these journals may influence the general pattern considerably.

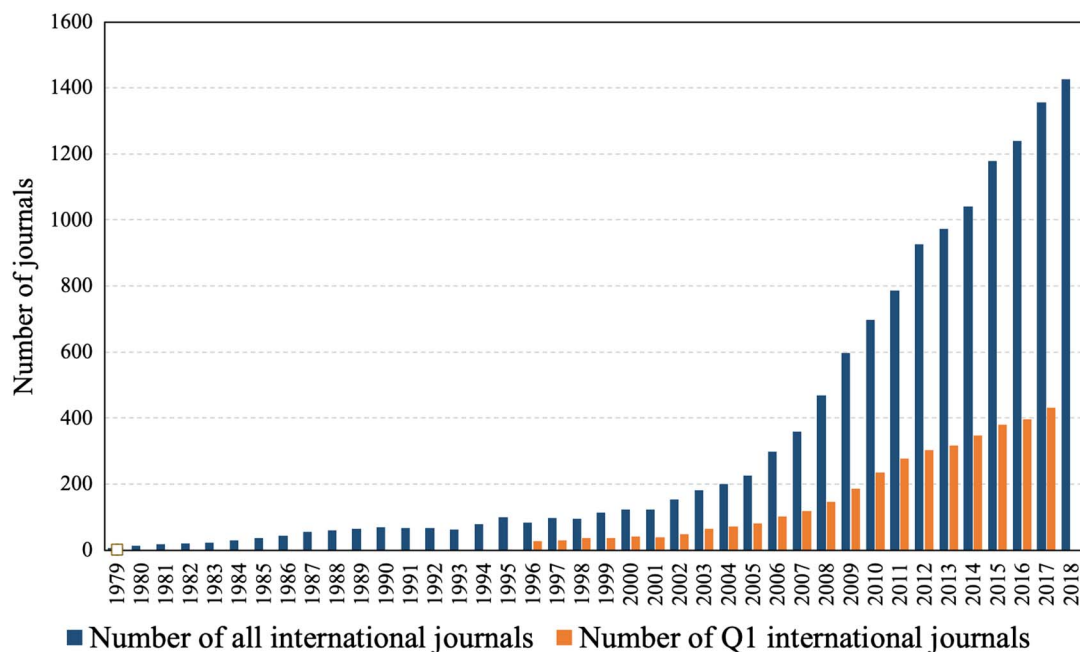


Figure 12. The number of all international journals and Q1 journals in which Chinese scholars published in social science fields (1979–2018).

3.3.1. Diversity of journals

The trend towards internationalization in the social sciences and humanities is characterized by increased use of specialized journals for publishing articles (Sivertsen, 2016). The growing diversity of international journals¹⁶ in which Chinese scholars publish may reflect three different aspects. First, Chinese researchers are publishing in a wider range of international journals. Figure 12 shows the increase in both the total number of international journals and the number of Q1 (first quartile according to impact factors, as illustrated in Section 2.2.4) international journals in which Chinese scholars published over the last four decades.

Another indication of journal diversification is the proportion of articles by Chinese researchers in the top 10 international journals ranked by the number of articles from Mainland China in social science fields. This proportion has shown a steady decline across all four periods, from 23.38% in 1979–1998 to 13.05% in 2014–2018, which also reflects the fact that Chinese scholars are publishing articles in a wider range of journals. A further indication can be seen when looking at international journals whose title contains “China” or “Chinese,” which indicates that these journals give special attention to research topics related to China¹⁷. As shown in Figure 13, during the early stage of internationalization, Chinese scholars were publishing a high proportion of their articles in international journals whose title contained “China” or “Chinese.” With the growth of internationalization in social science research in Mainland China, the proportion of articles published in these journals has decreased over time. The proportion of international social science journals that specifically target China-related topics, as indicated by their title, is also reduced considerably over time.

¹⁶ These journals are indexed in SSCI and can be classified into seven social science classifications, illustrated in Section 2.2.1.

¹⁷ For example, the title of the journal *China Economic Review* suggests that it tends to publish articles related to original research on the economy of China. See <https://www.journals.elsevier.com/china-economic-review>.

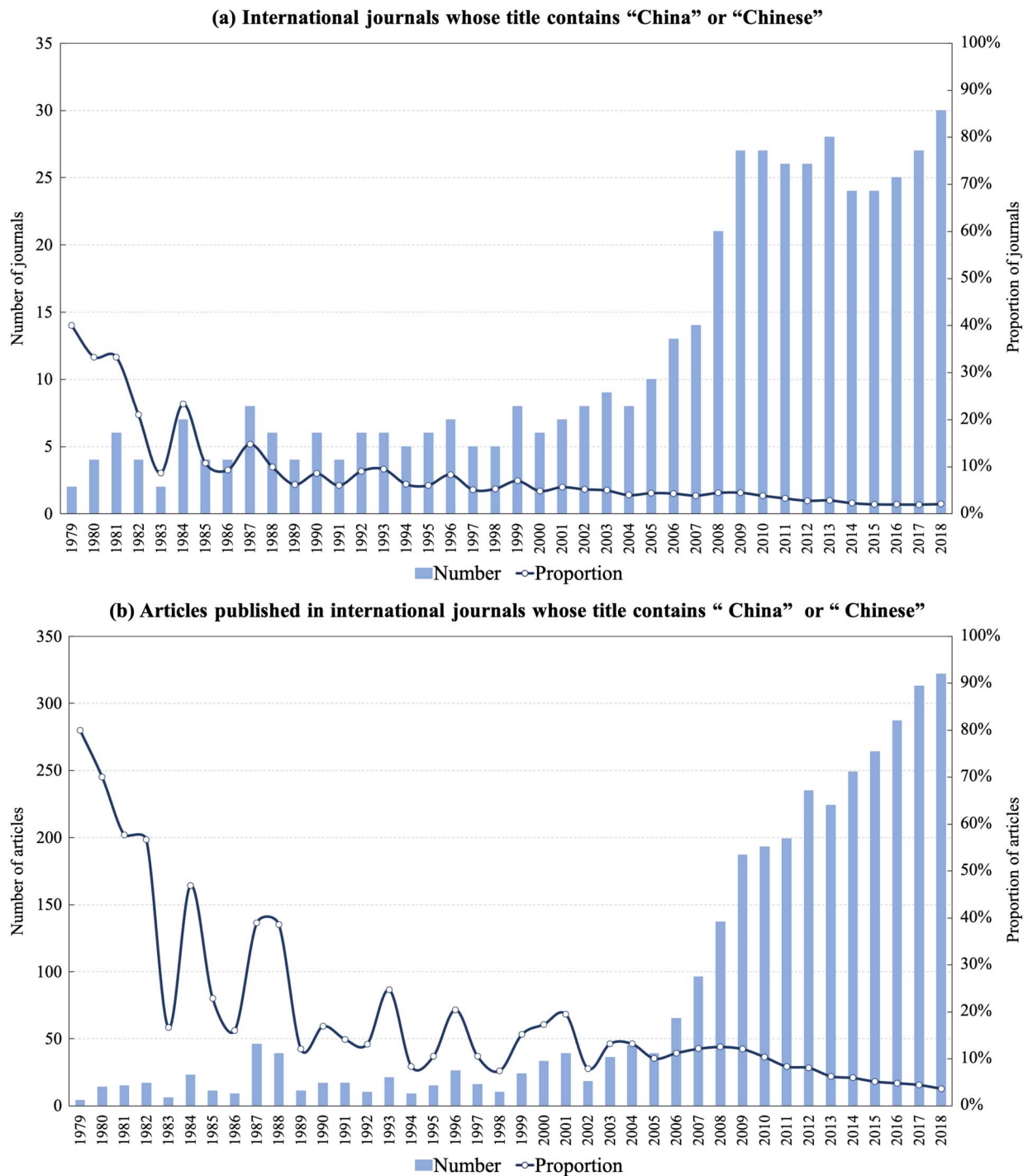


Figure 13. The international journals that contained “China” or “Chinese” in their title and articles published in these journals (1979–2018).

3.3.2. Journal quartiles

An article’s citation impact is an indication of the influence of a publication on further research. The journal impact factor is a standard indicator of a journal’s impact within and beyond its discipline, and generally speaking, the journals with higher impact factors are considered to be more

prestigious (Garfield, 2006). However, the impact factor and its use are widely debated at present (Zhang, Rousseau, & Sivertsen, 2017). We take the view that impact factor is not a perfect indicator of the scientific impact of journals, but it can still be considered as “a gauge of relative quality as judged by both researchers and practitioners” (Saha, Saint, & Christakis, 2003, p. 45; Waltman & Traag, 2020).

3.3.2.1. General journal quartile distribution Figure 14 charts the distribution of Mainland China’s social science articles by journal quartile. Overall, more articles appear in Q1 and Q2 than in Q3 or Q4. Among the four quartiles, Q1 journals account for the largest share of articles. We note that high-impact journals publish on average more articles than low-impact journals. Liu, Guo, and Zuo (2018) have found that 36% of SSCI publications are published in the first quartile journals based on data from the 2016 Journal Citation Reports, and a similar observation was reported in Liu, Hu, and Gu (2016) based on the 2015 volume’s WoS publications. There has been a steep decline in the proportion of Q4 articles since 2000. A clear tendency for Chinese scholars to increasingly publish articles in high-impact journals can be observed. This could not happen without a continuous improvement of the quality and international relevance of social science research stemming from or performed in collaboration with Mainland China. But the trend might also be influenced by the increasing use of journal impact factors and JCR quartiles as the criteria for evaluating a researcher’s scientific performance in Mainland China (Quan et al., 2017). However, as mentioned in Section 3.1.3, a radical change in policy was introduced in early 2020 (MOE, 2020; MOST, 2020). The new policy not only supports domestic publications in general but also states that indicators based on WoS (particularly journal impact factors and citations) will not be applied directly any more in evaluation and funding at any level in China. By moving away from WoS as a standard for research evaluation and funding, China is empowering its own academic communities, research institutions, and funding organizations in defining the principles, criteria, and protocols for evaluation (Zhang & Sivertsen, 2020). These clear changes in policy may reshape Chinese researchers’ publications landscape in the future.

3.3.2.2. Journal quartile distribution in different disciplines There are apparent differences across disciplines in the influence of journal hierarchies in the process of internationalization. In Figure 15, we analyze the journal quartile distribution of different disciplines in which social science articles by Chinese authors were published. *Business, Economics, Planning; Community*

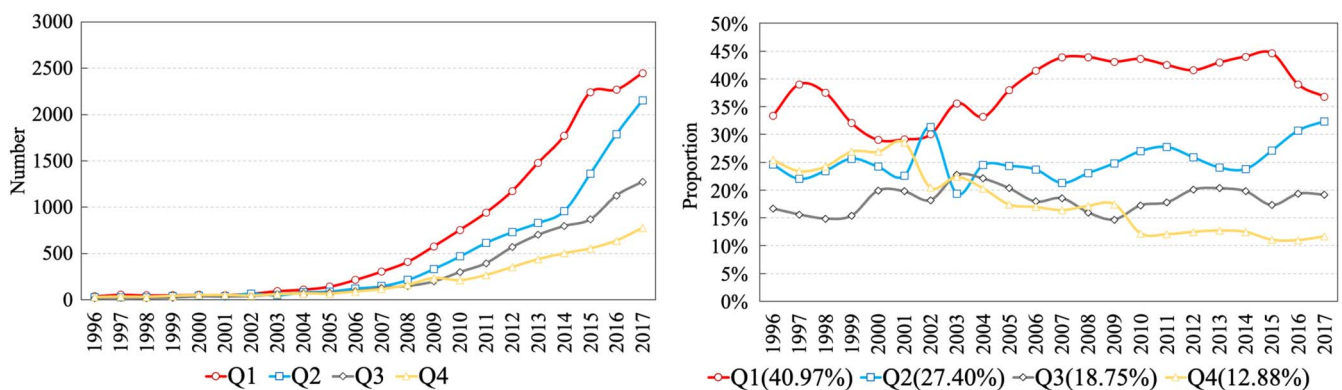


Figure 14. The number and proportion of social science articles from Mainland China by journal quartile (1996–2017).

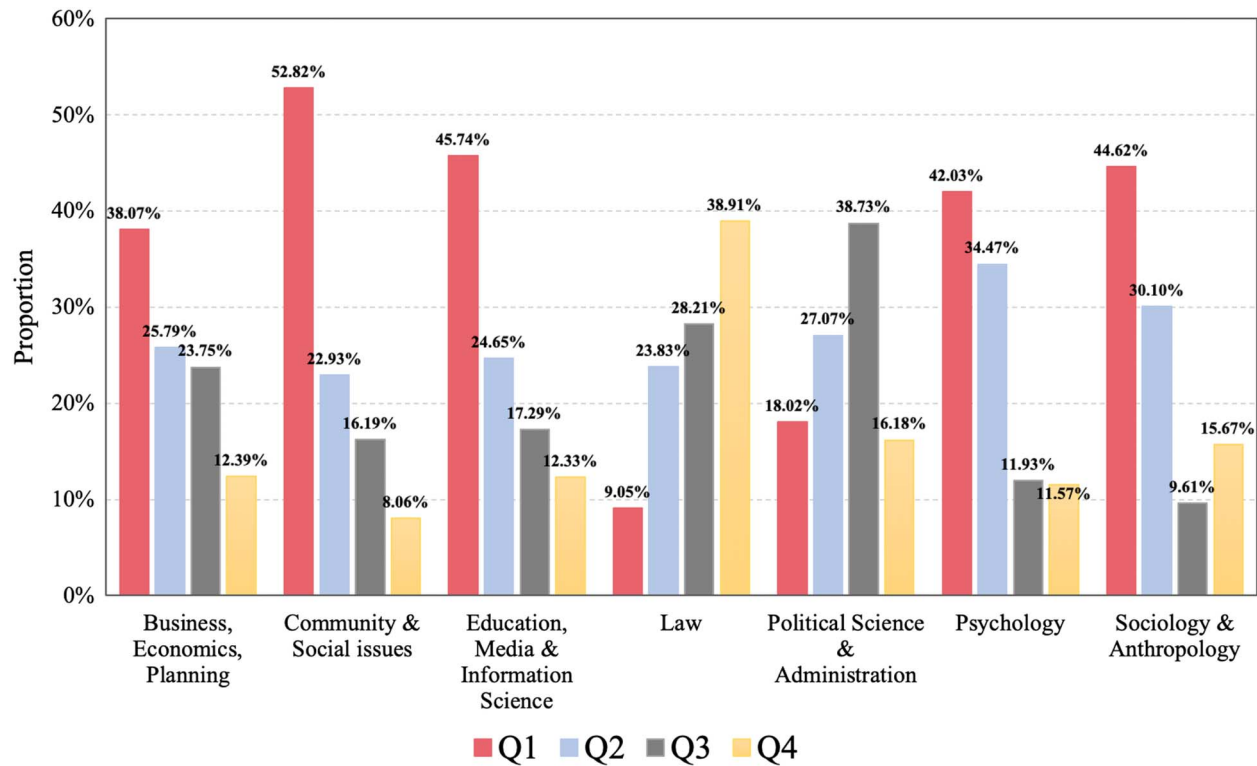


Figure 15. Journal quartile distribution in different disciplines (1996–2017).

& Social Issues; Education, Media & Information Science; Psychology; and Sociology & Anthropology have higher shares of articles in Q1 than in other quartiles. As a contrast, more than 50% of the articles in Political Science & Administration and Law are distributed in Q3 and Q4, which are the more locally oriented disciplines, as already observed in Figure 8. As two representative disciplines with low international collaboration and relatively more Mainland China-led articles (seen in Figure 8), Education, Media & Information Science and Community & Social issues have remarkably high performance in terms of journal quartile distributions.

3.3.2.3. Journal quartile distribution of different collaboration types International collaboration has grown in importance throughout the present century. It can improve the influence of academic research with the expansion of audiences in every region of the globe. There is a positive effect of international collaboration on scientific impact (Glänzel & Schubert, 2001; Leydesdorff, Bornmann, & Wagner, 2018). In this section, we further investigate how different types of international collaboration may relate to publications' distribution in different journal quartiles. As observed in Figure 16, over the period studied, the proportion of ICAs distributed in Q1 and Q2 is higher than that of N-ICAs, indicating that international collaboration is an important way to publish articles in journals with higher ranking by journal impact factors. In general, the proportion of N-ICAs in Q3 and Q4 during the period investigated is higher than for ICAs. One of the main reasons for this trend lies in the enhancing effect of collaborative work, which positively affects scientific impacts (Khor & Yu, 2016), but the difference may also be due to the higher international relevance of the topics studied when more than one country is involved (Sivertsen, 2016).

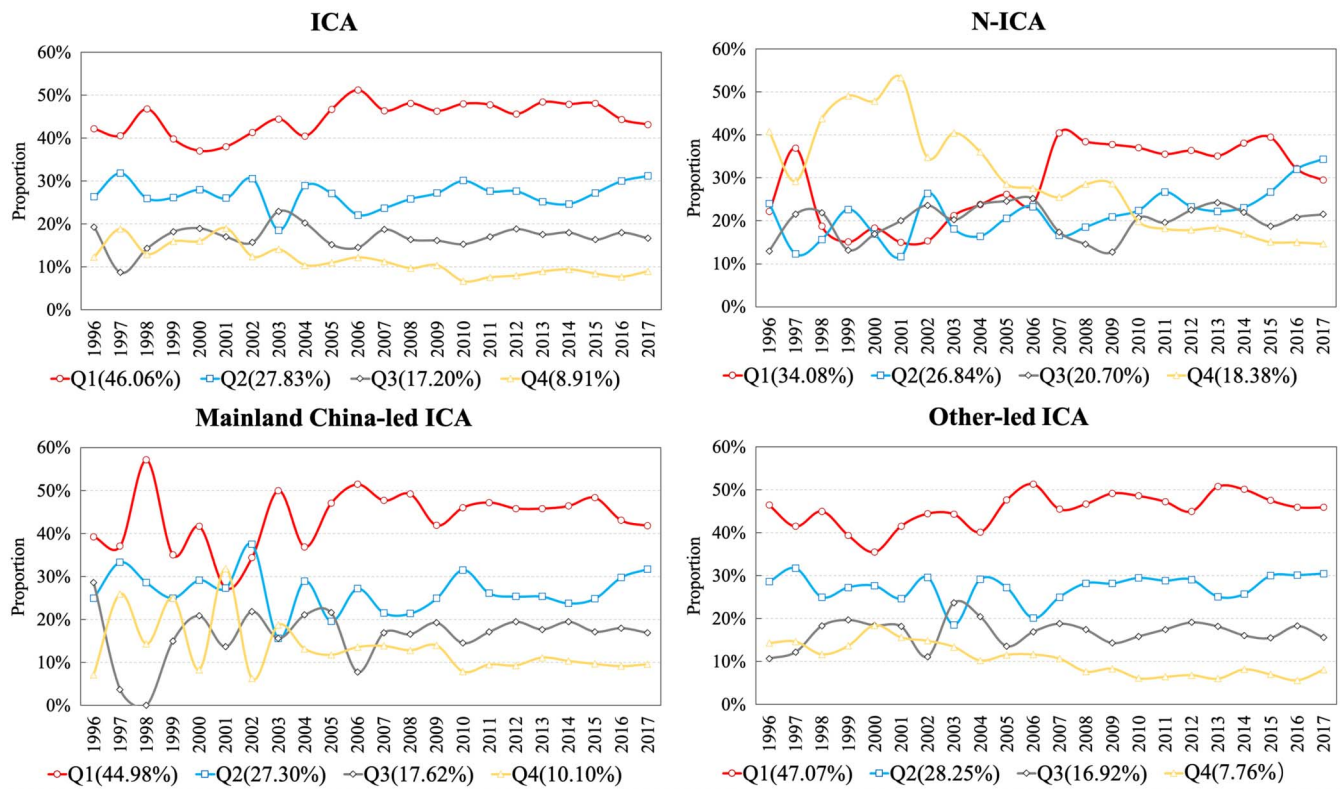


Figure 16. Journal quartile distribution of different collaboration types (1996–2017).

The distribution of ICAs among the journal quartile has remained relatively stable while fluctuating more in the case of N-ICAs. It is worth noting that 2006 was a distinct turning point for N-ICAs due to the influence of some specific journals:

- From 1996 to 2006, most of the N-ICAs were published in Q4 journals. Among these articles, nearly 50% were published in *Chinese Education and Society* (ISSN:1061-1932/0009-4560) and *Chinese Sociology and Anthropology* (ISSN:0009-4625).
- Since 2007, N-ICAs are increasingly published in Q1 journals. There was a surge in the number of N-ICAs published in *Energy Policy* (ISSN: 0301-4215) in 2007. From 2007 to 2016, 11% of all N-ICAs were published in this one particular journal that belongs to Q1.

Over the periods studied, the proportion of Other-led ICAs published in Q1 is slightly higher than that of Mainland China-led ICAs, while the proportion of Other-led ICAs published in Q4 is

Table 1. The statistics of articles from Mainland China in *Frontiers in Psychology*

Year	Number of articles	Quartile	Share of all articles in the corresponding quartile
2014	14	Q1	0.79%
2015	99	Q1	4.42%
2016	194	Q2	10.86%
2017	284	Q2	13.18%

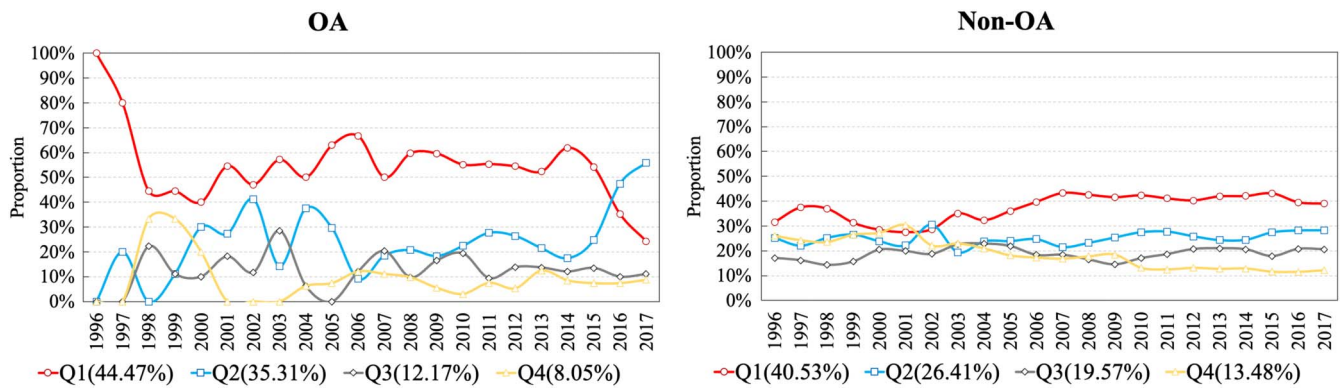


Figure 17. Journal quartile distribution of OA articles and Non-OA articles¹⁸.

slightly lower than Mainland China-led ICAs. The trends of Mainland China-led ICAs fluctuate in a relatively broader margin in every quartile compared to Other-led ICAs. Again, the publication of articles in higher ranked international journals may depend on the international versus local relevance of the topics.

3.3.3. Analysis of open access

The recent “nose dive” of the proportion of Q1 journals needs further comment (see Figure 14). Previous analysis indicated that during the period under investigation, there might exist some specific journals that publish large shares of the articles studied here. Table 1 further shows a particular example. The number of social science articles by Chinese authors published in *Frontiers in Psychology* (ISSN:1664-1078) has increased considerably since 2015, while the quartile of this journal fell from Q1 in 2015 to Q2 in 2016. Correspondingly, there was a rapidly increased proportion of articles published in Q2 during 2016 and 2017, as illustrated by Figure 14. In parallel, the proportion of articles published in Q1 decreased during 2016 and 2017. *Frontiers in Psychology* is a gold OA journal. Its publisher (Frontiers) has been the source of some debate in the same period, and this might have impacted its standing. Jeffrey Beall raised some questions about the academic quality of Frontier’s articles (Blouffoff-Indelicato, 2015) and listed Frontiers as a “potential, possible, or probable” predatory OA publisher. A study published in *Science* has shown that Beall’s list of predatory journals indeed has some reliability (Bohannon, 2013).

From the above analysis, the internationalization process of Mainland China’s social science research has also been affected by OA to some extent. With the development of digital publishing, free and unrestricted OA for readers on the internet has emerged as an additional avenue for presenting research (Prosser, 2003). With higher accessibility and visibility, OA plays an increasingly vital role in knowledge dissemination globally. In addition, previous studies have shown that authors from developing countries are usually more likely to perceive OA positively than authors from developed countries (Kieřć, 2017; Xu, He et al., 2020). Therefore, we would like to raise the question of how OA affects the international development of Mainland China’s social science research?

Numerous studies using different methodologies have suggested a citation advantage for OA articles (Atchison & Bull, 2015; Koler-Povh, Južnič, & Turk, 2014; Wohlrabe & Birkmeier, 2014).

¹⁸ The difference between an OA article and a Non-OA article is whether this article has OA information in WoS.

Table 2. Top five journals ranked by the number of OA articles in social science fields from Mainland China¹⁹

Journal (Ranked by OA articles)	Number of OA articles	Proportion of all OA articles	The proportion of OA articles in different collaboration types
Frontiers in psychology (ISSN:1664-1078)	922	15.24%	
Educational sciences-theory & practice (ISSN:2630-5984)	278	4.60%	
Eurasia journal of mathematics science and technology education (ISSN:1305-8215)	272	4.50%	
Bmc psychiatry (ISSN:1471-244X)	161	2.66%	
Frontiers in psychiatry (ISSN: 1664-0640)	130	2.15%	



Indeed, OA may increase the size of the audience and the impact of academic work. This visibility can also be reflected by the journal quartile for OA journals, which is based on the impact factor. Although the number of OA articles is far lower than non-OA articles, the proportion of OA articles distributed in high-impact journals is generally higher than that of non-OA articles in Mainland China’s social science fields (as shown in Figure 17). However, as mentioned above

¹⁹ The calculation of the proportions of N-ICA and ICA is based on all articles, while the calculation of the proportions of Mainland China-led ICA and Other-led ICA is based on international collaboration articles.

(Table 1), articles by Chinese researchers in the OA journal *Frontiers in Psychology* have influenced the proportion of Q1 and Q2 of OA articles from 2015 to 2017.

Furthermore, in the top five social science journals ranked by the number of OA articles from Mainland China, N-ICA and Mainland China-led ICA has a large proportion of all OA articles. This reflects a tendency of Chinese scholars to be the main players in publishing articles in these international OA journals (Table 2).

The two journals published by Frontiers (*Frontiers in Psychology* and *Frontiers in Psychiatry*) account for 17.39% of the total of OA articles. A third journal, *Eurasia Journal of Mathematics science and technology education* (ISSN: 1305-8215) was listed in *JCR Suppressed Titles* in 2017 due to anomalous citation patterns²⁰.

What is even more unusual in these five most frequent journals is that some of them published a large number of OA articles by Chinese social science researchers in a very short period. For example, *Educational Sciences Theory & Practice* (ISSN: 2630-5984) published 278 OA articles in the social sciences from Mainland China, 277 of which were published in 2018. Similarly, *Eurasia Journal of Mathematics Science and Technology Education* (ISSN: 1305-8215) published 272 OA articles in the social sciences from Mainland China, 234 of which were published in 2017. Finally, *Frontiers in Psychiatry* (ISSN: 1664-0640) published 130 OA articles in the social sciences from Mainland China, 105 of which were published in 2018.

As a whole, OA publishing has increased in Mainland China's social science in recent years. Likely to be affected by the former criteria of the research evaluation system in Mainland China (Quan et al., 2017), some unusual publishing activities can be observed in some OA journals, which may influence the analysis of internationalization. This phenomenon has also been observed in China's SCI publications. Liu (2020) found the overrepresentation of China in some OA journals. The most recently introduced research evaluation policy in China, as described in previous sections, is now giving more attention to the scientific and societal value of research, and less attention to the number of articles published and the impact factor of the journals. A further restriction of author payment for international journals has been set in the new Chinese policies. A change in Chinese researchers' publication patterns is expected after the new policies (Zhang & Sivertsen, 2020).

4. CONCLUSION AND DISCUSSION

4.1. Conclusion

Internationalization is necessary to align with international standards and gain from the exchange of information and collaboration at the research frontier. But balancing the research orientation towards local needs and topics is also necessary for the social sciences. It is a question of a dynamic balance with empirically informed strategies for both internationalization and localization. To support the empirical basis for such a dynamic balance, this paper has analyzed international academic articles, international collaboration, and international journals to provide a more complete picture of the internationalization process of social science research in Mainland China.

In a series of analyses covering the past four decades of research in the social sciences in Mainland China, we find obvious trends towards increased internationalization. Both international and domestic comparisons reveal a noticeable increase in the number and proportion of international articles published by Chinese researchers in the social science fields, especially in

²⁰ See <http://help.incites.clarivate.com/incitesLiveJCR/JCRGroup/titleSuppressions.html>.

the last decade. Although the international trend is evident in Mainland China's social science research, articles published in domestic journals are still by far the dominant publication form for Mainland China's social science scholarship. China is a much smaller contributor to global science in the social sciences than in the natural sciences.

As for the analysis from a more detailed perspective of international collaboration, we find that Chinese researchers are increasingly in the lead as first authors in articles resulting from international collaboration. The growth of Mainland China's scientific output in the social sciences has been accompanied by a diversification of collaboration partners around the globe, and its collaboration networks with other countries/regions have significantly broadened.

Furthermore, our findings also reveal that Chinese scholars publish in an increasingly wider range of international journals. Results show an increase in the number of articles published in high-impact international journals and especially those that involve international collaboration. An analysis of specific journals indicates that unusual academic publication activities are related to a few specific OA journals that have influenced our analysis markedly.

Finally, the degree of internationalization varies in different social science disciplines. *Business, Economics, Planning* and *Psychology* account for high proportions of international collaboration articles. However, the proportion of Mainland China-led articles and articles in Q1 journals are relatively higher in the fields of *Education, Media & Information, and Community & Social Issues*.

4.2. Discussion

As noted above, the results are a reflection of Mainland China's improved capacity for engaging in internationalization in social science research. Many factors may affect the international development of social science scholarship.

4.2.1. National policy

National policy has played a vital role in the international development of Mainland China's social sciences. Since 1978, Mainland China has adopted the Reform and Opening-up Policy (ROP), which allowed Chinese scholarship to enter the international mainstream. Science and technology in Mainland China have been very successful in making the transition, while Mainland China's social sciences have stagnated in comparison, with lower levels of internationalization and little global recognition (Xie, 2018). Since the beginning of the 21st century, a series of policies have been adopted to promote the development of the social sciences in Mainland China. A number of them are listed in Table 3.

As a result of policies that have been introduced to promote "outstanding achievements and distinguished scholars to the world arena"²¹, Mainland China has more recently seen the international standing of its social science research improve considerably. It remains to be seen whether this development continues after the most recent turn in orientation towards local needs in Chinese research policy (MOE, 2020; MOST, 2020; Zhang & Sivertsen, 2020).

4.2.2. Capital investment

Currently, research funding is emerging as one of the most important public resources for scientific development and internationalization. By providing financial support for research programs, institutions, and scientists, research funding plays a crucial function in knowledge production as well as

²¹ See http://www.chinadaily.com.cn/china/2007-10/25/content_6204663.htm.

Table 3. National policies related to international development for social sciences in Mainland China

Year	Authority	Policy documents	Source
2003	Ministry of Education of the People's Republic of China	Several opinions issued by the Ministry of Education on the development and prosperity of social sciences in colleges and universities	http://www.gov.cn/gongbao/content/2003/content_62171.htm
2004	Central Committee of the Communist Party of China	Opinions on further prospering the development of philosophy and social science	http://www.gov.cn/test/2005-07/06/content_12421.htm
2011	Central Committee of the Communist Party of China & General Office of the State Council of the People's Republic of China	Outline of national cultural reform and development plan in "12th Five-Year"	http://www.gov.cn/jrzg/2012-02/15/content_2067781.htm
2011	Ministry of Education of the People's Republic of China	The construction plan for key research bases for the humanities and social sciences in colleges and universities	http://old.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_2558/201301/146418.html
2011	Ministry of Education of the People's Republic of China	"Going out" plan for the humanities and social sciences in universities	http://www.moe.gov.cn/srcsite/A13/s7061/201111/t20111107_126303.html
2011	Ministry of Education of the People's Republic of China & Ministry of Finance of the People's Republic of China	Project for Social Science Prosperity in Higher Education Institutions	http://www.moe.gov.cn/srcsite/A13/s7061/201111/t20111107_126304.html
2011	Central Committee of the Communist Party of China	Decision of the CPC Central Committee on "Major Issues Pertaining to Deepening Reform of the Cultural System and Promoting the Great Development and Flourishing of Social Culture"	http://www.gov.cn/jrzg/2011-10/25/content_1978202.htm
2011	National Office for Philosophy and Social Sciences	National "12th Five-Year Plan" for Philosophy and Social Science Research	http://www.nopss.gov.cn/GB/219468/14820244.html

international development. There is a high level of research investment in Mainland China, with gross expenditure on R&D as 2.12% of GDP in 2017, which has begun to narrow the gap compared with 2.79% of the United States (OECD, 2019). During the period from 1979 to 2018, the authors of slightly over 50% of the social science articles that appeared in the SSCI database (24,755 out of 49,109) received some kind of research funding. This may demonstrate that research funding has played an important role in the international development of social sciences.

4.2.3. Research evaluation

The trend towards internationalization may also indicate the influence of research evaluation policies and monetary reward systems on publication activities in the social science fields in Mainland China. The WoS, which includes the Science Citation Index Expanded (SCIE), the SSCI, and the Arts and Humanities Citation Index (A&HCI), until recently played a crucial role in Mainland China's research evaluation system and monetary reward policies. Journal impact factors and JCR quartiles were used as eligibility criteria for funding and for evaluating the researcher's scientific performance (Quan et al., 2017). This may have influenced the number of articles published in high-impact journals. In addition, most universities' scientific research evaluation system sees the role of "first author" and their affiliated institutions as conditions for recognizing achievement, which may have influenced the growth in N-ICA articles and in Mainland China-led ICA articles.

The recent change in policy for research evaluation and funding encourages researchers to publish more in domestic journals. The policy is launched at a time when the annual volume of domestic articles indexed by the CSSCI is still around 10 times higher than the annual volume of articles from China indexed by the SSCI for the WoS. It remains to be seen whether China will still gain from the process of internationalization of the social sciences, as the societal contributions of research will be valued more in the evaluation system. Hopefully, localization and internationalization will not be seen as opposed to each other.

4.2.4. Individual incentives

As for the individual level, the increasing number of international publications by Chinese scholars may be a result of the researchers' willingness to see their articles published in international journals. Researchers gain scholarly credit in the academic reward system by performing research and publishing their results internationally, and reputation is an influential consideration for employment, promotion, funding, and increases in salary (de Rijcke et al., 2016; Weingart, 2005). Studies have shown that articles published in recognized international journals gain better visibility than those published in national journals (Khor & Yu, 2016; Puuska et al., 2014; Sin, 2011). Furthermore, researchers can largely benefit and improve their work from high-quality reviews through the review process in international journals. The increasing number of international articles and articles published in high-impact journals might reflect the strong motivations that Chinese scholars have for being recognized within international academia. It may also reflect an increasing interest in the international communities of the social sciences in engaging in topics relevant to China and in collaboration with Chinese researchers. Finally, international publishing is important for Chinese researchers who studied abroad and who want to continue in their international networks and collaborations as researchers. In particular, young researchers are generally more active in publishing internationally than older researchers. Hence, the new policy (MOE, 2020; MOST, 2020) resonates differently in the academic community. Some researchers are happy to leave behind the policy of globalization. Others are concerned that support for collaborating and publishing abroad will be taken away from them (Zhang & Sivertsen, 2020).

4.3. Limitations and Future Research

There are several limitations to this study. The first relates to mostly relying on articles from SSCI (except for CSSCI in one analysis). For a deeper understanding of the internationalization of social sciences, future research should incorporate data from multiple sources and include publications of several types, because multilingual publishing and other publication formats than journal articles are important in the social sciences (Sivertsen, 2019). Also, regarding international data sources, the Emerging Sources Citation Index (ESCI), which has indexed social science articles, could be added as an additional data source for further research (Huang, Zhu et al., 2017). Moreover, there are also other measures and indicators useful for investigating the internationalization of scientific research, such as using citation analysis to reflect the international academic impact and using research topics to investigate knowledge diffusion internationally. Finally, some unusual academic publishing activities, such as the rapid growth of OA articles and the overrepresentation of China in some OA journals, deserve further investigation in our future study.

AUTHOR CONTRIBUTIONS

Lin Zhang: Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing—review & editing. Yuanyuan Shang: Data curation, Formal Analysis, Visualization, Writing—original draft. Ying Huang: Funding acquisition, Software, Supervision, Validation, Writing—review & editing. Gunnar Sivertsen: Conceptualization, Funding acquisition, Writing—review & editing.

COMPETING INTERESTS

The authors have no competing interests.

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DATA AVAILABILITY

The raw bibliometric data were collected from Clarivate Analytics. A license is required to access the Web of Science database. Therefore, the data used in this paper cannot be posted in a repository.

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APPENDIX

Table A1. ECOOM social science classifications and the correspondence with WoS categories

ECOOM (Social Sciences I & Social Sciences II)	WoS Category
Business, Economics, Planning	Business
	Business, Finance
	Economics
	Hospitality, Leisure, Sport & Tourism
	Industrial Relations & Labor
	Management
	Planning & Development (Development Studies)
Community & Social Issues	Cultural Studies
	Demography
	Social Issues
	Social Sciences, Biomedical
	Social Sciences, Interdisciplinary
	Social Work
	Area Studies
	Asian Studies
Education, Media & Information Science	Urban Studies
	Communication
	Education & Educational Research
	Education, Special
	Information Science & Library Science
Law	Education, Scientific Disciplines
	Criminology & Penology
	Law
Political Science & Administration	International Relations
	Political Science
	Public Administration

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Table A1. (continued)

ECOOM (Social Sciences I & Social Sciences II)	WoS Category	
Psychology (Added classification)	Psychiatry	
	Psychology, Applied	
	Psychology, Biological	
	Psychology, Clinical	
	Psychology, Developmental	
	Psychology, Educational	
	Psychology, Experimental	
	Psychology, Mathematical	
	Psychology, Multidisciplinary	
	Psychology, Psychoanalysis	
	Psychology, Social	
	Sociology & Anthropology	Anthropology
		Ethnic Studies
Family Studies		
Sociology		
Women's Studies		
Sport Sciences		
Folklore		