

CHINESE CO-AUTHORED PAPERS IN THE HUMANITIES AND SOCIAL SCIENCES INDEXED BY SSCI AND A&HCL, 1995-2004: A STATISTICAL ANALYSIS

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ABSTRACT

Collaborative research is one of the most noteworthy trends in the development of scientific research, and co-authored papers are some of the most important results of this research. With the speed-up of globalization, wider adoption of computers and advanced communication technologies, and more frequent academic exchanges and co-operation, collaborative research across organizations, regions, and fields has provided greater access to Chinese researchers in the humanities and social sciences. Accordingly, co-authored papers have witnessed considerable growth in number and proportion. The Social Sciences Citation Index (SSCI) and the Arts & Humanities Citation Index (A&HCI), published by the Institute for Scientific Information (USA), enjoy a high reputation worldwide as large-scale and comprehensive retrieval systems for international large comprehensive papers and citations. This article aims to reveal the trends of Chinese collaborative research in the humanities and social sciences from the perspective of bibliometrics and offer advice for Chinese researchers and managers in these fields, by analyzing Chinese co-authored papers in the humanities and social sciences indexed in the SSCI and A&HCI in the last decade (1995-2004).

Keywords: Collaborative research, Chinese co-authoring papers, Social sciences, Humanities, SSCI, A&HCI

1 INTRODUCTION

As an important way of expanding research capacity, complementing resource strengths, and promoting knowledge exchanges and sharing, collaborative research has become one of the noteworthy trends in scientific research development. Today, man is confronted by a large number of issues, which have gone beyond national or regional boundaries and even the scope of traditional disciplines. Therefore, many research projects, in particular those of significance, would seem hardly feasible if they relied solely on the effort of one individual, organization, or even one country. Accordingly, the proportion of collaborative research across organizations, regions, and borders has seen a steady rise. Besides, research as such is heading for higher levels, more profound depths, and a broader scope. This kind of development has been felt not only in the fields of science and technology but also in the humanities and social sciences.

With the deepening of China's reform and the increase of its comprehensive national strength, Chinese researchers have had more access to collaborative research. What then are the development and status of collaborative research in the humanities and social sciences in China? This concerns scientific researchers as well as scientific administrations. So far, however, relevant data and research results have proven to be scarce.

The Social Science Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), and Science Citation Index (SCI), edited and published by the Institute for Scientific Information, constitute together a well-known, large-scale comprehensive worldwide retrieval system for academic papers. Currently, the system is available in print, CD-ROM, and online editions and can be retrieved in various ways. It has been used widely for bibliometric research and scientific assessment by scientific research and management organizations in many countries.

In 1987, the Institute of Scientific and Technical Information of China was entrusted by the former State Science and Technical Commission to conduct an annual statistical analysis on Chinese papers in the fields of science and technology indexed in the SCI and to regularly publish the these statistics (Institute of Scientific and Technical Information of China, 2004, 2005). This work has produced considerable impact throughout China. In contrast, similar work in the humanities and social sciences lags behind.

Co-authored papers are one of the important forms of collaborative research. The purpose of this article is to do a statistical analysis on Chinese co-authored papers in the humanities and social sciences indexed in SSCI and A&HCI during the last decade (1995-2004), in an effort to reveal the status and trends of Chinese collaborative research, to make better use of international scientific data resources and to promote the development of China's collaborative research in this regard.

For some reason (language in particular), data on Chinese co-authored papers have not been fully reflected in the SSCI and A&HCI, and we would not expect to have a panoramic view. Even so, relevant analysis may serve to open a window on the trends of China's collaborative research in the humanities and social sciences.

The data used in this article come from the retrievals of SSCI and A&HCI (network version) during the period 1995-2004 with the "People's Republic of China" as key words (Hong Kong and Taiwan regions of China are not included). In other words, "China" means Mainland China, while the Hong Kong and Taiwan regions of China are considered two separate statistical units in this article. For example, the international co-authored papers refer to those collaborated between Mainland China and other countries (regions), including Hong Kong and Taiwan regions of China.

2 DATA

2.1 Co-authored papers

2.1.1 Number of co-authored papers vs. solely authored papers

In 1995-2004, the number of Chinese co-authored papers in the humanities and social sciences included in SSCI and A&HCI increased from 110 in 1995 to 388 in 2004, at an average rate of 31 papers per year. Meanwhile, the proportion of Chinese co-authored papers was relatively high, with an annual average of 73.5%. As shown in Table 1, the proportion rose from 85% to 92% in 1995-1997, dropped to 60% in 1998, and climbed again in 1999-2004. The proportion has stayed at around 70% since 1999 (See Table 1 and Figure 1).

During the same period, the number of Chinese solely authored papers rose from 20 in 1995 to 169 in 2004, at an average rate of 16.5 papers per year. However, with the exception of an abrupt increase from 11 to 108 in 1998, the amount of annual increase was limited in most years. The proportion of solely authored papers, averaging 26.5%, was much lower than that of co-authored papers. In 1995-1998 (with the exception of 1997), this ratio turned upward and remained at around 30% in 1999-2004. The ratio of solely authored papers to co-authored ones is roughly 3 to 7, as shown in Table 1 and Figure 1.

Table 1. Chinese co-authored and solely authored papers in the SSCI and A&HCI, 1995-2004

Year	Total	Co-authored		Solely authored	
		Papers	Proportion (%)	Papers	Proportion (%)
1995	130	110	85	20	15
1996	168	131	78	37	22
1997	133	122	92	11	8
1998	267	159	60	108	40
1999	313	203	65	110	35
2000	314	218	69	96	31
2001	525	361	69	164	31
2002	390	287	74	103	26
2003	514	376	73	138	27
2004	557	388	70	169	30

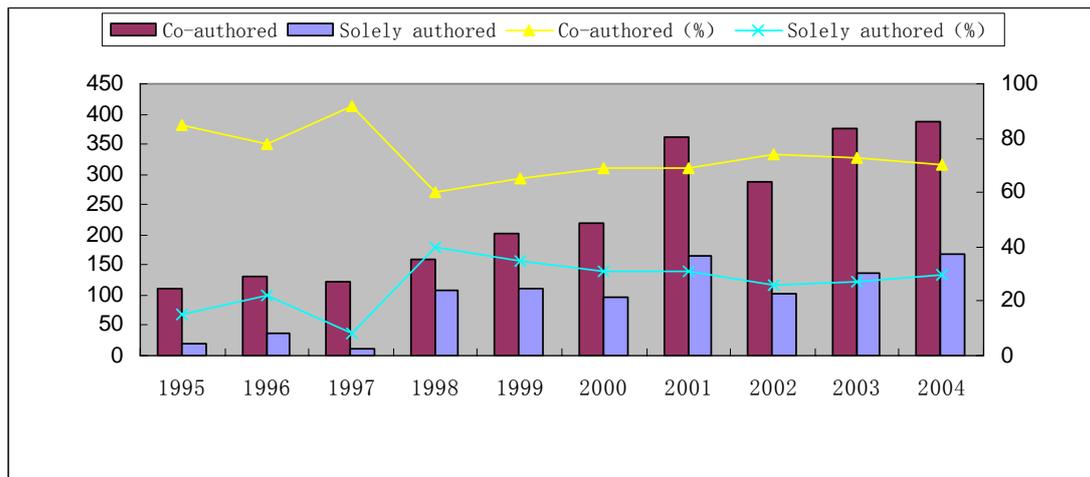


Figure 1. Chinese co-authored and solely authored papers in the SSCI and A&HCI, 1995-2004

2.1.2 Number of domestically co-authored papers vs. internationally co-authored papers

Chinese domestic co-authored papers included in the SSCI and A&HCI increased from 57 in 1995 to 98 in 2004, at an average rate of 4.5 papers per year. With the exception of 2001, which saw a fast growth from 56 to 148, no significant increase was found in most years. Still, the proportion of domestically co-authored papers dropped from 52% in 1995 to 25% in 2004, at an average rate of 3 percentage points per year. Generally, the number of domestically co-authored papers turned downward during the period, with fluctuations throughout.

In contrast, internationally co-authored papers have witnessed an obvious increase from 53 in 1995 to 290 in 2004, at an average rate of 26 papers per year. Also, the proportion of internationally co-authored papers increased from 48% to 75%, at an average rate of 3 percentage points per year. The year 1998, in particular, witnessed a considerable increase in proportion from 53% to 77%. After 1998, with the exception of 2001, the proportion of internationally co-authored papers basically stayed at about 70%, in a ratio of 7 to 3 with domestically co-authored papers. The results are shown in Table 2 and Figure 2.

Table 2. Chinese domestically and internationally co-authored papers in the SSCI and A&HCI, 1995-2004

Year	Total	Domestic		International	
		Papers	Proportion (%)	Papers	Proportion (%)
1995	110	57	52	53	48
1996	131	66	50	65	50
1997	122	57	47	65	53
1998	159	37	23	122	77
1999	203	62	31	141	69
2000	218	56	26	162	74
2001	361	148	41	213	59
2002	287	71	25	216	75
2003	376	101	27	275	73
2004	388	98	25	290	75

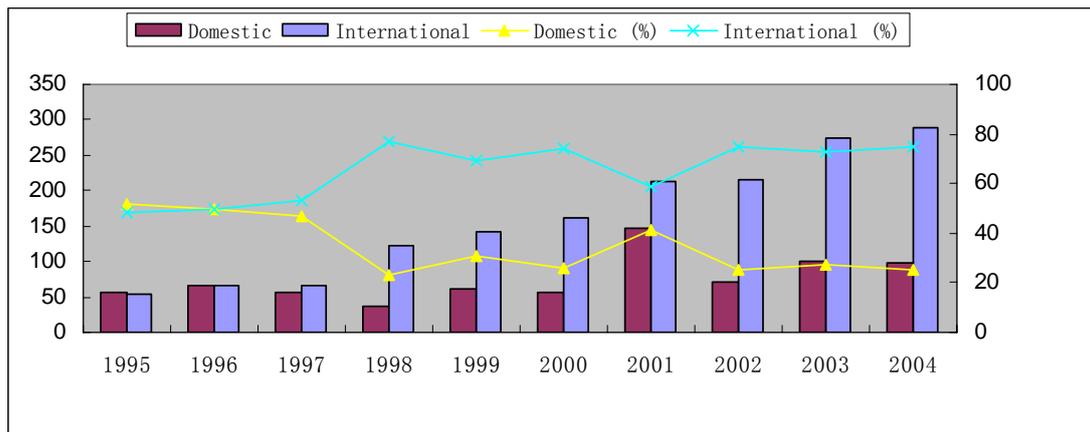


Figure 2. Chinese domestically and internationally co-authored papers in the SSCI and A&HCI, 1995-2004

2.2 Distribution of the collaborative forms of co-authored papers

2.2.1 Distribution of the collaborative forms of domestically co-authored papers

In terms of the distribution of the collaborative forms of domestically co-authored papers included in the SSCI and A&HCI, co-authored papers from the same institution increased from 49 in 1995 to 67 in 2004. With the exception of an abrupt rise from 36 to 108 in 2001, no significant increase was found in most years. However, the proportion of co-authored papers from the same institution remained relatively high, at an average of 72.6% per year, though with declines (at the average of 1.88 percentage points per year) in between, as shown in Table 3 and Figure 3.

In the same period, co-authored papers from the same province increased from 3 to 17. Meanwhile, the proportion also showed a tendency for a slow increase from 5% to 17%, at an average rate of 1.3 percentage points per year. Meanwhile, inter-provincial co-authored papers also rose slowly from 5 to 14 in number, and from 9% to 14% in proportion, at the average rate of 1.9 percentage points per year.

As a result, in this decade, co-authored papers both within one province and across provinces showed a tendency for slow growth. However, the proportion was still far lower than that of co-authored papers within one institution. That ratio has remained at 3 to 7 since 1998.

Table 3. Collaborative forms of Chinese domestically co-authored papers in the SSCI and A&HCI, 1995-2004

Year	Total	Same institution		Same province		Inter-provincial	
		Papers	Proportion (%)	Papers	Proportion (%)	Papers	Proportion (%)
1995	57	49	86	3	5	5	9
1996	66	55	83	7	11	4	6
1997	57	53	93	3	5	1	2
1998	37	26	70	4	11	7	19
1999	62	44	71	10	16	8	13
2000	56	36	64	11	20	9	16
2001	148	108	73	22	15	18	12
2002	71	43	60	14	20	14	20
2003	101	58	57	23	23	20	20
2004	98	67	69	17	17	14	14

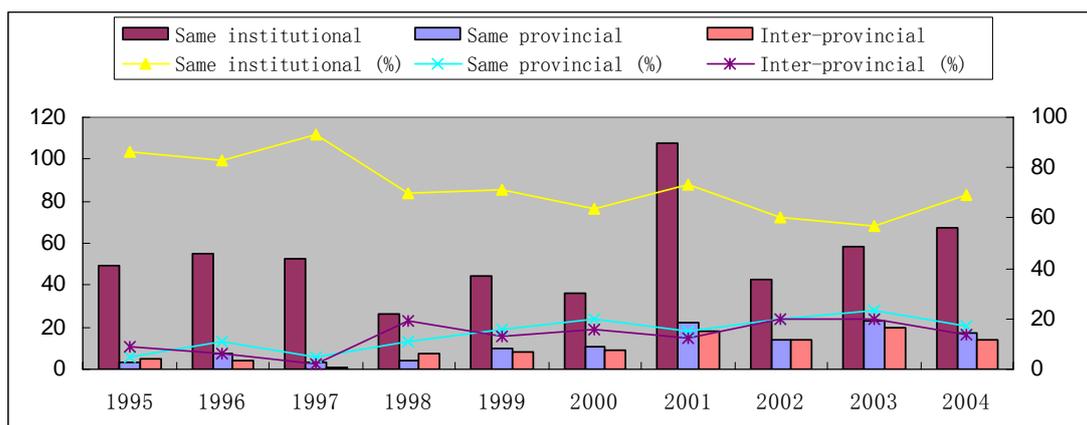


Figure 3. Collaborative forms of China domestically co-authored papers in SSCI and A&HCI, 1995-2004

2.2.2 Distribution of the collaborative forms of domestic co-authored papers

As shown in Table 4, bilaterally co-authored papers, those with partners from two countries (regions), increased from 42 in 1995 to 227 in 2004. They dominate Chinese co-authored papers not only in number but in proportion (up to 80%).

In tripartite co-authored papers, those with partners from three countries (regions), there was a slow increase from 3 to 52 in number and from 6% to 18% in proportion.

And in multilaterally co-authored papers, those with partners from more than four countries (regions), there was an also slow increase from 8 to 11 in number and yet a slow decrease from 15% to 4% in proportion. Please refer to Table 4 and Figure 4.

Taking the decade as a whole, bilaterally co-authored papers have far surpassed tripartite and multilateral ones in number, in a rough ratio of 8 to 2.

Table 4. Collaborative forms of Chinese internationally co-authored papers in the SSCI and A&HCI, 1995-2004

Year	Total	Bilateral		Tripartite		Multilateral	
		Papers	Proportion (%)	Papers	Proportion (%)	Papers	Proportion (%)
1995	53	42	79	3	6	8	15
1996	65	53	81	9	14	3	5
1997	65	54	83	7	11	4	6
1998	122	100	82	18	15	4	3
1999	141	113	80	18	13	10	7
2000	162	139	86	16	10	7	4
2001	213	176	83	27	12	10	5
2002	216	172	80	36	17	8	3
2003	275	219	80	47	17	9	3
2004	290	227	78	52	18	11	4

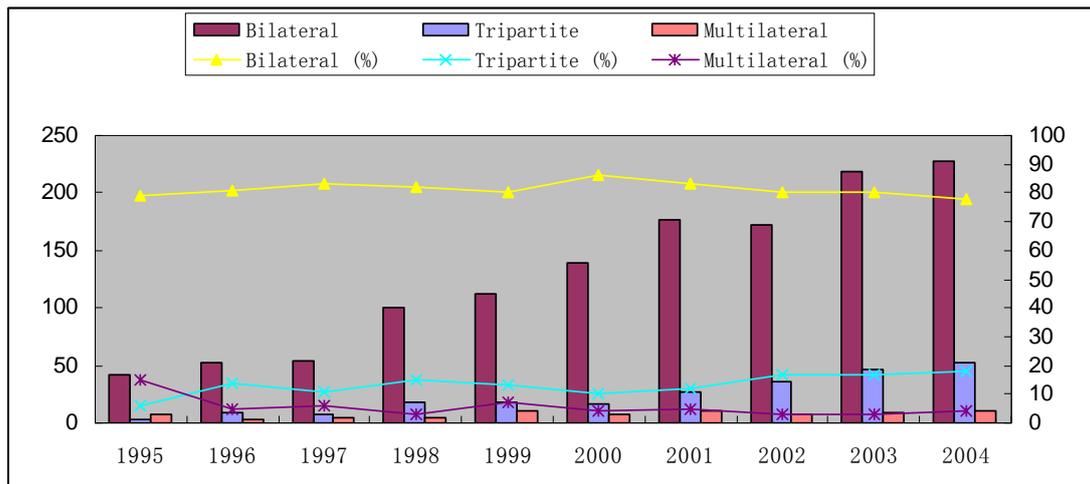


Figure 4. Collaborative forms of Chinese internationally co-authored papers in the SSCI and A&HCI, 1995-2004

2.3 Distribution of the partner countries (regions) of internationally co-authored papers

2.3.1 Internationally co-authored papers with China researchers as first authors

As shown in Table 5, during the period 1995-2004, Chinese internationally co-authored papers with Chinese researchers as first authors increased from 13 to 83 in number. The proportion also saw a slight growth from 25% to 29% but still less than 30%. In 1997-2000, the proportion dropped to 18-20%.

During the same period, internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants, increased from 40 to 205. This increase was particularly marked in 1998 and 2003. While at the same time, the proportion of internationally co-authored papers declined slightly from 75% in 1995 to 71% in 2004 but still was over 70%. In 1997-2000, the proportion rose again to 80%. And in 2001-2004, the ratio of these papers to those with Chinese researchers as first authors stabilized at roughly 3 to 7.

Table 5. Internationally co-authored papers with Chinese researchers as first authors in the SSCI and A&HCI, 1995-2004

Year	Total	China-first authors		non-China-first authors	
		Papers	Proportion (%)	Papers	Proportion (%)
1995	53	13	25	40	75
1996	65	16	25	49	75
1997	65	12	18	53	82
1998	122	22	18	100	82
1999	141	25	18	116	82
2000	162	33	20	129	80
2001	213	59	28	154	72
2002	216	58	27	158	73
2003	275	71	26	204	74
2004	290	85	29	205	71

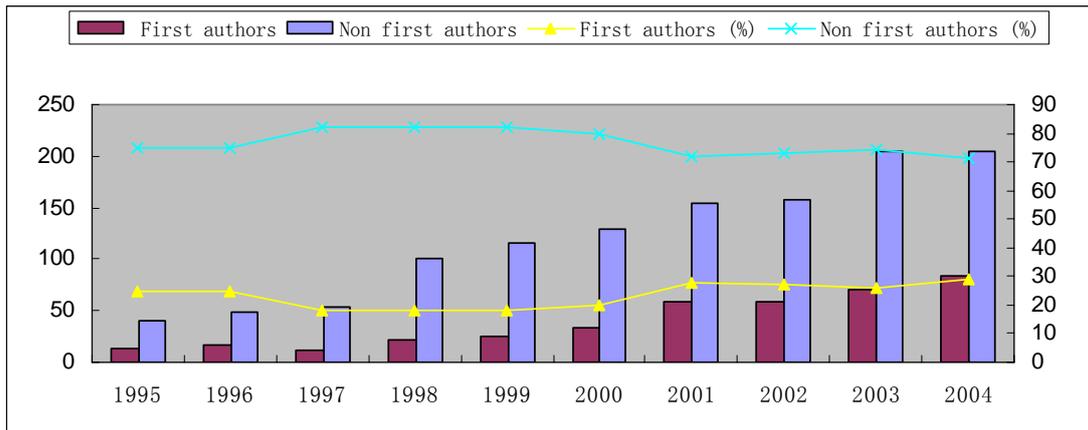


Figure 5. Internationally co-authored papers with Chinese researchers as first authors in the SSCI and A&HCI, 1995-2004

2.3.2 Number of partner countries (regions) involved in internationally co-authored papers

As shown in Table 6, there were only 5 partner countries (regions) involved in the Chinese internationally co-authored papers with Chinese researchers as first authors in 1995. By 2004, this number increased to 13. Among them, the bilaterally co-authored papers increased from 12 to 72; and the tripartite co-authored papers increased from 1 to 12. As for the multilaterally co-authored papers, only one turned up in 2003 and 2004 respectively.

During the same period, the number of partner countries (regions) involved in the internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants increased from 23 in 1995 to 49 in 2004. Among them, the bilaterally co-authored papers increased from 30 to 155; the tripartite co-authored papers increased from 2 to 40; and the multilaterally co-authored papers increased from 8 to 10.

As a whole, in 1995-2004, the partner countries (regions) involved in the internationally co-authored papers with Chinese researchers as first authors had a limited increase in number. These are chiefly bilaterally co-authored papers, which are followed by tripartite co-authored papers. However, multilaterally co-authored papers are scarce. In contrast, the partner countries (regions) involved in the internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants are obviously larger in number. Although bilaterally co-authored papers also dominate, both the tripartite and multilaterally co-authored papers increase considerably. This case is different from the former.

Table 6. Countries (regions) involved Chinese internationally co-authored papers in SSCI and A&HCI, 1995-2004

Year	Chinese researchers as first authors				non-Chinese researchers as first authors			
	Partners (个)	Bilateral (篇)	Tripartite (篇)	Multilateral (篇)	Partners (个)	Bilateral (篇)	Tripartite (篇)	Multilateral (篇)
1995	5	12	1	0	23	30	2	8
1996	8	15	1	0	15	38	8	3
1997	4	10	2	0	22	44	5	4
1998	7	22	0	0	28	78	18	4
1999	7	21	4	0	27	92	14	10
2000	10	28	5	0	26	111	11	7
2001	14	52	7	0	45	122	20	12
2002	12	54	4	0	32	118	32	8
2003	14	59	11	1	26	160	36	8
2004	13	72	12	1	49	155	40	10

2.3.3 Major partner countries (regions) involved in internationally co-authored papers

In terms of the partner countries (regions) involved in the Chinese internationally co-authored papers, the first 5 countries (regions) in the internationally co-authored papers with Chinese researchers as first authors are: the USA, Hong Kong of China, the UK, Japan, and Australia, as shown in Table 7.

During the same period, the first 5 top-ranking partner countries (regions) in the internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants are: the USA, Hong Kong of China, the UK, Japan, and Canada, as shown in Table 7.

In both cases, the top-ranking partner countries (regions) roughly overlap. The USA ranks first, followed by Hong Kong of China, the UK, Japan, Canada, or Australia. Table 7 shows that the papers written with Hong Kong of China as a key partner region saw an obvious increase after 1998.

Table 7. Major partner countries (regions) involved China international co-authored papers in SSCI and A&HCI, 1995-2004

Year	5 countries (regions) ranking of top	
	Chinese-first authors	non-Chinese -first authors
1995	USA (5) Canada (4) Hong Kong region (3) Australia (1) New Zealand (1)	USA (26) Canada (6) Hong Kong region(5) Japan (5) Australia (5)
1996	USA (8) UK (2) Australia (2) Canada (1) Netherlands (1) Croatia (1) Cuba (1) Singapore (1)	USA (32) UK (9) Japan (7) Canada (5) Australia (4)
1997	USA (8) UK (4) Australia (1) France (1)	USA (32) Japan (10) UK (5) Hong Kong region (4) South Korea (2)
1998	USA (10) Hong Kong region (3) Japan (3) UK (3) Taiwan region (1) Canada (1) France (1)	USA (54) Hong Kong region (16) Japan(12) UK (9) Canada (9)
1999	USA (9) UK (7) Hong Kong region (6) Sweden (3) Canada (2)	USA (60) Hong Kong region (23) UK (21) Australia (10) Canada (7)
2000	USA (16) Hong Kong region (7) Japan (4) UK (3) Sweden (3)	USA (67) Hong Kong region (26) Japan (15) UK (10) Canada (8)
2001	USA (33) Hong Kong region (15) Japan (5) UK (2) Singapore (2)	USA (83) Hong Kong region (36) Canada (16) UK (16) Japan (13)
2002	USA (27) UK (9) Hong Kong region (8) Belgium (4) Netherlands (3) Japan (3)	USA (85) Hong Kong region (34) UK (17) Canada (13) Japan (11)
2003	USA (30) Hong Kong region (17) UK (9) Japan (5) Australia (4) Germany (4)	USA (109) Hong Kong region (52) UK (19) Canada (16) Japan (11)
2004	USA (39) Hong Kong region (27) UK (12) Australia (5) Canada (3) Sweden (3)	USA (106) Hong Kong region (52) Canada (17) UK (15) Japan (14)

Note : The figures in brackets are the number of papers.

2.3.4 Internationally co-authored papers with the most partner countries (regions)

In 1995-2004, the internationally co-authored paper with Chinese researchers as first authors with the most partner countries (regions) was “Health equity in transition from planned to market economy in China,” published in the *Health Policy and Planning* of the UK in 2002. This paper involved 5 authors from 4 institutions of 4 countries or regions. It was also the only paper involving more than 3 authors from more than 3 countries or regions during this period.

During the same period, the internationally co-authored paper with non-Chinese researchers as first authors and Chinese researchers as participants with the most partner countries (regions) was “Culture-level dimensions of social axioms and their correlates across 41 cultures,” published in the *Journal of Cross-Cultural Psychology* of the USA in 2004. This paper involved 65 authors from 35 institutions in 23 countries (regions). A second paper with the most partner countries(regions) was “Do national levels of individualism and internal locus of control relate to well-being: an ecological level international study,” published in the *Journal of Organizational Behavior* of the UK in 2001, involving 30 authors from 21 institutions of 18 countries (regions).

3 Discussion

The statistics and analyses shown above have some implications and provide food for further thought. Next, we shall discuss the major results.

3.1 Co-authored papers may bring about more attention from international academia

In all the Chinese papers in the humanities and social sciences indexed in the SSCI and A&HCI, the proportion of co-authored papers remains high, at an annual average of over 70%. In other words, the proportion of co-authored papers to solely authored ones is 7 to 3. This tendency has become more apparent since 2001. In a sense, it shows co-authored papers may bring about more attention and recognition than solely authored ones from international academia.

3.2 Internationally co-authored papers tend to be more easily integrated into international practice

The number of internationally co-authored papers is increasing year by year and is gradually gaining predominance. Its proportion rose from 48% in 1995 to 75% in 2004, at an annual average rate of 3 percentage points. In contrast, domestically co-authored papers showed no obvious increase in number, and the proportion decreased from 52% in 1995 to 25% in 2004. Since 1998, the ratio of internationally co-authored papers to domestic ones has stayed about 7:3. This shows that on the one hand, Chinese researchers in the humanities and social sciences have had more opportunities to participate in internationally collaborative researches and on the other, internationally co-authored papers tend to be more easily integrated into international practice.

3.3 Collaborations within one institution and bilateral collaborations are more common collaborative forms

In 1995-2004, co-authored papers from the same institution accounted for over 70% of all the domestically co-authored papers, although the ratio is in a slight decline. While at the same time, co-authored papers from the same province saw a slow increase, and their proportion is far lower than that of co-authored papers from the same institution. As for internationally co-authored papers, bilaterally co-authored papers assume a predominant position, at a proportion of about 80%. This is much higher than tripartite or multilaterally co-authored papers.

As is shown, collaboration within an institution is more common in domestic collaborations of the humanities and social sciences as is also the case with bilateral collaboration in international collaborations of the humanities and social sciences.

3.4 China has not yet played a leading role in internationally collaborative research

In 1995-2004, the proportion of internationally co-authored papers with Chinese researchers as first authors increased slightly from 25% to 29%. This is much lower than that of internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants. The ratio is about 3 to 7. This shows that Chinese researchers in the humanities and social sciences up until now have not yet played a leading role in internationally collaborative researches.

3.5 Internationally collaborative researches with non-Chinese researchers as first authors involve wider area coverage

In 1995-2004, the number of partner countries (regions) involved in the internationally co-authored papers with Chinese researchers as first authors increased from 5 to 13. In contrast, the number of partner countries (regions) involved in the internationally co-authored papers with non-Chinese researchers as first authors and Chinese researchers as participants increased from 23 to 49. It shows to a certain extent, that the latter tend to involve larger scale and wider coverage in research.

3.6 The main partners come from national (regional) economic and scientific powers

In terms of the partner countries (regions) involved in the internationally co-authored papers, whether with Chinese researchers as first authors or with non-Chinese researchers as first authors and Chinese researchers as participants, the top-ranking partner countries (regions) are: The United States, Hong Kong of China, the United Kingdom, Japan, Canada, and Australia. This shows that, apart from the Hong Kong Special Administrative Region, major Chinese internationally co-authored papers in the humanities and social sciences are the products of cooperation with national (regional) economic and scientific powers.

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