

Citation Type Analysis for Social Science Literature in Taiwan

Ming-yueh Tsay

mytsay@nccu.edu.tw

Graduate Institute of Library, Information and Archival Studies, National ChengChi University (Taiwan)

Abstract

Through citation analysis, this study explored the distribution of document type, language and publication year for citations in social science journals. Samples were research articles published in 2010 from first-rank journals, as assessed by the Department of Humanities and Social Sciences, National Science Council and indexed in Taiwan Social Sciences Citation Index (TSSCI). The section in which citations appeared, namely introductions, methodologies, results, and conclusions, were also examined. Conclusions and suggestions are made based on the research results and interdisciplinary comparisons. For social science studies in Taiwan, the major findings are as follows: 1. Journals and books were the most cited materials, and English was the language of most citations. 2. Social scientists in Taiwan tended to cite materials published within 10 years with a citing half-life of approximately 11 years. 3. The ratio of articles following the IMRAD format was high in Taiwan social science journals. 4. Citations in these social science journals occurred most frequently in the introduction section, while they occurred least frequently in the conclusions. 5. Social scientists mostly cite to set the stage for their current studies. 6. The citation type is highly related to the citation location.

Conference Topic

Citation and co-citation analysis

Introduction

Since the social sciences are associated with human society, its patterns, where it goes and how it works, it can enrich the values and contents of our lives. In contrast, the “hard sciences” have been the focus of attention with the rapid growth of technology grew, and the social sciences have received less attention. This has led to a lack of balance between academic and technical research in many developing countries. To gain attention and support from governments and the public, social scientists need to promote their research outcomes and impacts much more effectively via the presentation and communication of their scholarly articles.

A research article may consist of body text and references; the former is the citing article, and the latter are cited articles. Relations between the citing and the cited may explain the interaction, development and communication among disciplines, and can reveal current research interests and future trends. Citations have multiple roles and unique functions in scholarly communication; for example, a cited article may present broader research contents, explain methods applied in a research or provide information and discussion that support a specific perspective.

The importance of journal articles for scholarly communication and academic assessment motivates the present study on Taiwanese social science journal articles to explore and compare their characteristics and types of citations via methods of bibliometric and citation analysis. The research outcomes may improve the knowledge of citation, and serve as reference for future empirical researches for the social science studies in Taiwan.

Other Citation Studies

Citations have been studied using context or content analysis, whereby the analysis determines the citation type based on the surrounding text. Frost (1979) mentioned the complexity of citation function and that the classification of citation function and proper schemes for classification received little attention in citation studies. To explore the nature of

citation use, some various schemes of classification for different disciplines have been developed to explain the functions of citations and the relations between body text and citations.

In Moravcsik and Murugesan's (1975) study physics citations fall into the "applied/used" category with 60% and 40% of the citations being general acknowledgements. In the study of Voos and Dagaev (1976), inspected the locations of each citation in sample articles and found that articles of biology and medicine were mostly cited within two to three years after their publication, and were cited the most in the introduction section, and next in the discussion section.

Peritz (1983) selected a variety of social science journals in which the basic methodologies of empirical social research were used and analyzed into the categories of a citation classification scheme. That study revealed that generally, "setting the stage for the present study" citations rank first. To carry out the reliability citation classification scheme, Peritz further investigated the association between classification and location and found that the marginal frequencies of the location introduction, methods and discussion were fairly close to the frequencies of the classification categories of setting the stage, methodology, and comparison and argument, respectively.

More recently, Harwood (2008) interviewed six informants who were computer scientists and six who were sociologists on the functions of citations in their writing. His findings reveal that position, supporting, and credit are relatively frequent across both disciplines, although the engaging function is far more frequent in the sociology texts.

Case and Miller (2011) investigated the citation practice of a group of citing authors with an interest in bibliometric or scientometric research, finding that the most popular reason was "this reference is a 'concept marker'," which distantly followed by "reviews prior work in the area" and other reasons.

The above literature survey shows there have been many studies investigating citation category and citation practices, which are likely to vary from discipline to discipline. This motivates the present study to further explore the citation type of articles cited in the social science journals published in Taiwan.

Research Method and Limitation

The journals selected in this research were six first-ranked journals indexed in the Taiwan Social Sciences Citation Index (TSSCI) in the disciplines of sociology, education, psychology, political science, economics and management. In this study, it is assumed that the first ranked journal of each discipline may represent the research characteristics of that discipline.

Articles published in 2010 and following the IMRAD format were selected as research samples, though articles published earlier than 2010 were also collected if there were insufficient samples. The titles of journals and number of articles selected for the six disciplines were: sociology, *Taiwanese Journal of Sociology*, 15 articles (2008-2010); education, *Bulletin of Educational Psychology*, 31 articles (2010); psychology, *Chinese Journal of Psychology*, 16 articles (2010); political science, *Taiwan Political Science Review*, 16 articles (2008-2010); economics, *Academia Economic Papers*, 13 articles (2010); management, *Journal of Management*, 25 articles (2010).

In the present study, if introductions and literature reviews were in two different sections, they were considered as an introduction in combination; if results and discussion were in one section, they would be categorized as result. Citations were categorized, on the basis of the classification scheme proposed by Peritz (1983), which requires little subjective judgment and is easy to carry out even without in-depth knowledge of the subject field.

Full texts and references of all 116 research articles were downloaded from online databases

or photocopied from printed journal and processed with Excel (Microsoft, U.S.) into bibliographical files. Employing bibliometric techniques and citation analysis, this study explored article type of journal, language of citation, citation years, document types of citations, citation types and locations of citations, the relations between citation type and location, and comparison among six disciplines of social sciences in Taiwan.

This study conducted purposive sampling to acquire journal articles for citation analysis, whose results might thus be limited indeed and less representative for each or the whole of humanities disciplines. Nevertheless, the current study aims to distinguish the meaningful characteristics of article structures, citation locations, and citation types of the six social science disciplines of Taiwan; also the method of “citation content analysis” used in this study to explore the nature of citation types is qualitative and justified by the attempt to interpret the existing phenomena. In the above senses, purposive sampling and unequal sample size seemed to be acceptable limitations.

Results

In this study, citation characteristics and locations in body texts are discussed according to article type of journal, language of citation, year of the highest citation and citation half-life, document type of citation, citation location and citation type.

Article Type of Journal

Papers published in social science journals in Taiwan are mainly divided into research articles and review articles. In general, research articles comply with the IMRAD format. The ratio of articles following the IMRAD format was high in the social sciences. Table 1 demonstrates review and research articles, both appeared in the disciplines of political science and sociology, while journals in the fields of psychology, education, economics and management preferred research articles.

Table 1 shows that, among the six disciplines, education, economics and management composed completely (100%) of research articles that follow the format of IMRAD.

Table 1. Article types in social science journals of Taiwan.

<i>Discipline (Journal name)</i>	<i>Papers</i>	<i>English article</i>	<i>Chinese review article</i>	<i>Chinese research article</i>	<i>% of Chinese Research article</i>
Political Science (<i>Taiwan Political Science Review</i>)*	30	1	13	16	55.2%
Sociology (<i>Taiwanese Journal of Sociology</i>)*	25	0	10	15	60.0%
Education (<i>Bulletin of Educational Psychology</i>)	32	1	0	31	100.0%
Psychology (<i>Chinese Journal of Psychology</i>)	23	4	3	16	84.2%
Economics (<i>Academia Economic Papers</i>)	18	5	0	13	100.0%
Management (<i>Journal of Management</i>)	30	5	0	25	100.0%
Total	158	16	26	116	81.7%

*Semi-annual journal. Sample articles of these journals were dated back to 2008 from 2010; samples of other journals were articles published in 2010.

Language of Citation

Materials in Chinese and English were the major source of references cited in social science articles, with the former accounting for 21.5% and the latter 78% of the total references collected. Most of the references in economics (93.5%) and management (92.1%) were English papers, while Chinese articles were infrequently used in both disciplines. Domestic research articles and reference materials, however, were used quite often by scholars of sociology (30.7%) and political science (43.4%).

Year of the Highest Citation and Citing Half-Life

Table 2 reveals the year of highest citation, citation age and citing half-life of articles in sample journals. Citing half-life refers to the time span from the current year to the year whose accumulated number of citations accounts for 50% of total citations in the journal. For example, the citing half-life of *Chinese Journal of Psychology* shown in Table 2 was 11, indicating that half of its citations were younger than 11 years as the citing articles being published. The time span of citation half-life reflects the currency of cited materials: the longer the citing half-life, the older the cited materials, and vice versa.

Table 2. Distribution of year of the highest citation, citation age of the highest citation and citing half-life.

<i>Discipline (Journal name)</i>	<i>Year of the highest citation</i>	<i>Citation Age</i>	<i>Citing half-life</i>
Political Science (<i>Taiwan Political Science Review</i>)*	2007	4	10.6
Sociology (<i>Taiwanese Journal of Sociology</i>)*	2006	5	11.5
Education (<i>Bulletin of Educational Psychology</i>)	2005	6	11.2
Psychology (<i>Chinese Journal of Psychology</i>)	2006	5	11.0
Economics (<i>Academia Economic Papers</i>)	2007	4	11.4
Management (<i>Journal of Management</i>)	2004	7	11.2
Average	2006	5.2	11.2

Based on the year of highest citations, the number of citations earlier than 2004 is decreasing for earlier articles. In other words, the older the articles were, the fewer citations they received. In general, for articles published in 2010 the peak of citations fell between 2004 and 2007 that suggests citations that received from the sample journals reached a peak after four to seven years of its publication, five years in most cases. A large number of citations came from articles published in the recent several years, indicating that social scientists have a tendency to cite the most recent articles. In the social science fields, scholars tended to cite materials with a citing half-life of approximately 11 years. For social scientists in most disciplines, 50% of their research needs could be satisfied by articles published after 2000, and the tendency to cite the most recent articles indicates the social science research depends on more current literature.

Document Type of Citation

In the six top journals selected as samples in this study, there were 116 Chinese articles following the IMRAD format, citing 6,063 references to the bibliographic files built by this study. According to the bibliographic data collected, journals and books were the most

frequently cited, accounting for 88% (journals 65% and books 23%) of all types of cited materials. The uses of journals and of books in economics were quite different, with the highest interval over 76%, in which journals accounted for 82% of cited materials while books accounted for 6%. The second-highest difference between citations of journals and of books was in management, where journals accounted for 80% of the citations, which was 67% higher than books. For other disciplines, such as social science (journals 53% vs. books 35%) and political science (journals 49% vs. books 34%), the differences between the use of journals and books were not as great, indicating that they have a closer value in both disciplines. On the average, over all types of documents, social scientists preferred to use journals in exploration and support of their own research.

Aside from the citations of journal articles and book materials, the number of theses and dissertations cited in the journal of education was higher than those in journals of other disciplines. Online resources such as websites or electronic files were cited more frequently in the political science journal, suggesting that political scientists use more digital literature as references in their research. Research reports were cited more in the journal of economics than in other disciplines, which indicates that economists tended to prove or support their own research by data or results provided by research reports. Furthermore, the fact that economists and scholars of management cited a few unpublished manuscripts and working papers showed the significance of informal and unpublished materials to these two disciplines.

Citation Location

The number and location of citations from the 116 articles complying with the IMRAD format were calculated to analyze the distribution of citations in structured research articles. There were 11,149 citations collected in the section of introduction (literature review included), methods and materials, results, and discussion.

The distribution of citations in different sections of an article may help to determine the status, research patterns and characteristics of a discipline. As Table 3 shows, citations appeared the most in the introduction section of articles in every discipline of social science. The Introduction may include literature reviews, and both sections need a few references for proving points or serving as motivations. In the six disciplines of social science, the highest number of citations in the introduction sections occurred in the journals of sociology and political science, while the lowest was in the journal of economics. For the method section, scholars of economics and management cite more frequently in the section of methods and materials. In contrast, the sociologists cite the least frequently.

Table 3. Distribution of citation location in social science journals of Taiwan.

<i>Discipline</i>	<i>Introduction</i>		<i>Methodology & Materials</i>		<i>Results</i>		<i>Discussion</i>		<i>Total</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
Management ¹	1,799	65.4	480	17.3	256	9.3	216	7.9	2,751	24.7
Economics ²	499	54.6	164	17.9	189	20.7	62	6.8	914	8.2
Political Sci. ³	931	70.5	171	13.0	165	12.5	53	4.0	1,320	11.8
Psychology ⁴	1,048	58.6	198	11.1	222	12.4	320	17.9	1,788	16.0
Education ⁵	1,888	64.1	282	9.6	295	10.0	481	16.3	2,946	26.4
Sociology ⁶	993	69.4	63	4.4	254	17.8	120	8.4	1,430	12.8
Total	7,158	64.2	1,358	12.2	1,381	12.4	1,252	11.2	11,149	100

1. Journal of Management; 2. Academia Economic Papers; 3. Taiwan Political Science Review; 4. Chinese Journal of Psychology; 5. Bulletin of Educational Psychology; 6. Taiwanese Journal of Sociology

In the results section, economists tended to cite more articles for comparison and contrast. Aside from economics, the number of citations in the results section of the sociology journal

also high. In the management journal, descriptive statistics and quantitative analysis may be the major causes of its lower number of citations in the results section.

In the discussion section, the number of citations may reflect scholars' degree of concern about deliberations and evaluation of research outcomes. The top two numbers of citations in discussion section occurred in the journals of psychology and education.

Citation Type

In addition to the distribution of citation location, Peritz's classification scheme of citation type is used to classify articles cited in the sample journals. Mapping was made to inspect the relations between citation type and citation location and to analyze the differences among the six disciplines. The eight categories of citation classification scheme proposed by Peritz (1983, pp.304-305) are: 1. Setting the stage for the present study; 2. Background information; 3. Methodological; 4. Comparative; 5. Argumentative speculative, hypothetical; 6. Documentary; 7. Historical and 8. Casual.

Table 4. Distribution of citation type.

<i>Citation type</i>	<i>Sociology</i>		<i>Education</i>		<i>Psychology</i>		<i>Political Science</i>		<i>Economics</i>		<i>Management</i>		<i>Total</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
Setting the stage for the present study	271	56.7	153	53.5	235	58.6	311	56.3	133	48.9	411	63.8	1,514	57.5
Background information	44	9.2	15	5.2	21	5.2	23	4.2	9	3.3	13	2.0	125	4.7
Methodological	33	6.9	34	11.9	54	13.5	85	15.4	85	31.3	109	16.9	400	15.2
Comparative	70	14.6	35	12.2	68	17.0	46	8.3	38	14.0	72	11.2	329	12.5
Argumentative, speculative, hypothetical	45	9.4	48	16.8	23	5.7	17	3.1	5	1.8	38	5.9	176	6.7
Documentary	15	3.1	0	0.0	0	0.0	66	12.0	2	0.7	1	0.2	84	3.2
Historical	0	0.0	1	0.3	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Casual	0	0.0	0	0.0	0	0.0	4	0.7	0	0.0	0	0.0	4	0.2
Total	478	-	286	-	401	-	552	-	272	-	644	-	2,633	-

Based on Table 4, the highest percentage of citations classified as "setting the stage for the present research" appeared in the journal of management (64%), and the lowest in the journal of economics (49%). Compared to other types of citation, citations that set the stage for the present study were significantly high in all six disciplines. The citation type of "background information" was most frequently found in the journal of sociology, while it was least frequent in the journal of management. The journal of economics contained the most methodological citations, which accounted for 31% of total citations, while the journal of sociology the least, which accounted for 7%; the interval between was rather large. Comparative citations were most found in the journal of psychology (17%) and the least in the journal of political science (8%). The journal of education included the most citations (17%), which were used in the presentation of argument, speculation, and hypothesis while the journal of political science the least (merely 3%). Documentary citations accounted for 12% of total citations in the journal of political science, which was the top among the six disciplines; whereas there was no such type of citations found in the journals of education and psychology. The citation types of "historical" and "casual" were hardly found in the journals of six disciplines, with only one historical citation in the journal of education and four casual citations in the journal of political science.

The distribution of citation type may reveal the research characteristics of a certain disciplines. For example, scholars of management tend to cite a large amount of literature to support or motivate their own research, whereas economists cite more methodological materials in their works, which indicates that research methods are valued more in economics. Political scientists tended to cite more raw data to support their studies; whereas scholars of education cited more articles for argumentation, speculation, and hypothesis. Comparative citations appeared the most in the journal of psychology, suggesting that psychological researchers tend to introduce other research in their own studies for comparison, correction, or corroboration.

Citation Type and Citation Location

According to Peritz's study, citation type was highly relevant to citation location. In this study, therefore, the relation between citation type and citation location in the six discipline sample journals was analyzed as follows.

Sociology

As Table 5 shows, in the journal of sociology, the number of citations that set the stage for the present study was 271, accounting for 56.7% of the total citations. Comparative citations accounted for 14.6% of the total citations, suggesting that the materials being cited in the journal articles were used to describe or support the present research. The citation type of "setting the stage for the present study" appeared primarily in the introduction section, while methodological citations that introduced the process of other research were mostly in the methods and materials section. In the results section, comparative, argumentative, speculative, and hypothetical citations accounted for the greatest number of citations. In the discussion session, comparative citations comprised the major part of total citations.

Table 5. Citations in Taiwanese Journal of Sociology by category and location.

Category \ Location	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	271	86.0	0	0.0	0	0.0	0	0.0	271	56.7
Background information	30	9.5	1	4.0	13	18.8	0	0.0	44	9.2
Methodology	7	2.2	19	76.0	7	10.1	0	0.0	33	6.9
Comparative	0	0.0	0	0.0	23	33.3	47	68.1	70	14.6
Argumentative, speculative, hypothetical	3	1.0	0	0.0	23	33.3	19	27.5	45	9.4
Documentary	4	1.3	5	20.0	3	4.3	3	4.3	15	3.1
Historical	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Casual	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	315	100.0	25	100.0	69	100.0	69	100.0	478	100.0

Education

In the journal of education, the citation type of "setting the stage for the present study" accounted for the largest percentage of the total citations, 53.5%, as shown in Table 6. The distribution of methodological citations, comparative citations, and argumentative, speculative and hypothetical citations was rather even. Similar to the distribution in the sociology journal, all of the citations that set the stage for the present study appeared in the introduction section, and the citations in methods and materials section were mostly methodological citations, while there were few citations in the results section. As for the

discussion part, the numbers of comparative, argumentative, speculative and hypothetical citations, especially the last three types, greatly exceeded other types of citation, indicating that scholars of education often introduced other research for detailed exploration, or made further inference based on previous studies.

Table 6. Citations in Bulletin of Educational Psychology by category and location.

Location Category	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	153	90.5	0	0.0	0	0.0	0	0.0	153	53.5
Background information	12	7.1	0	0.0	0	0.0	3	3.8	15	5.2
Methodology	3	1.8	30	100.0	1	12.5	0	0.0	34	11.9
Comparative	0	0.0	0	0.0	1	12.5	34	43.0	35	12.2
Argumentative, speculative, hypothetical	0	0.0	0	0.0	6	75.0	42	53.2	48	16.8
Historical	1	0.6	0	0.0	0	0.0	0	0.0	1	0.3
Total	169	100.0	30	100.0	8	100.0	79	100.0	286	100.0

Psychology

In the journal of psychology, as Table 7 presented, over half of its citations were classified as the type of “setting the stage for the present studies” (58.6%). In the discussion section, comparative citations accounting for 71% of total citations appeared in the discussion section, which suggests that psychologists tend to cite other materials as comparisons to examine whether their research results were consistent with previous studies, or to correct previous research and hereafter propose their own unique results.

Table 7. Citations in Chinese Journal of Psychology by category and location.

Location Category	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	235	93.6	0	0.0	0	0.0	0	0.0	235	58.6
Background information	16	6.4	4	7.3	0	0.0	1	1.3	21	5.2
Methodology	0	0.0	48	87.3	6	30.0	0	0.0	54	13.5
Comparative	0	0.0	3	5.5	12	60.0	53	70.7	68	17.0
Argumentative, speculative, hypothetical	0	0.0	0	0.0	2	10.0	21	28.0	23	5.7
Total	251	100.0	55	100.0	20	100.0	75	100.0	401	100.0

Political Science

From Table 8, it is clear that “setting the stage for the present study” citations were the most numerous of the eight types of citation, accounting for 56% of the total citations in the journal of political science. The second most numerous were the methodological citations, though they comprised only 15% of total citations, while the percentage of other types of citations was even lower. Interestingly, political scientists cited much more statistical data in the introduction section, which indicates that they tended to use quantitative data or factual information to support their studies when writing introduction and literature review. As for the other locations, comparison was often made in the results section, while citations in the discussion section mostly served as bases for inference.

Table 8. Citations in Taiwan Political Science Review by category and location.

Category \ Location	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	305	79.0	6	6.3	0	0.0	0	0.0	311	56.3
Background information	16	4.1	6	6.3	1	1.9	0	0.0	23	4.2
Methodology	7	1.8	73	76.0	5	9.3	0	0.0	85	15.4
Comparative	0	0.0	3	3.1	40	74.1	3	18.8	46	8.3
Argumentative, speculative, hypothetical	0	0.0	0	0.0	4	7.4	13	81.3	17	3.1
Statistical data	58	15.0	4	4.2	4	7.4	0	0.0	66	12.0
Casual	0	0.0	4	4.2	0	0.0	0	0.0	4	0.7
Total	386	100.0	96	100.0	54	100.0	16	100.0	552	100.0

Economics

Though the “setting the stage for the present study” citations were more numerous than other types of citations in the journal of economics, its percentage was a bit lower than in other disciplines, accounting for only 49% of all the citations in the journal. Table 9 also shows that economists cited more methodological materials, accounting for 31% of all citations, indicating a preference for empirical study in the field of economics. Models or methods proposed by other research were frequently found in the studies of economics, and comparative citations were mostly made in the section of results, which is consistent with the inference that economists were used to comparing their research results with previous studies. However, few citations in the discussion section revealed little of the characteristics of citation types in the journal of economics.

Table 9. Citations in Academia Economic Papers by category and location.

Category \ Location	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	129	92.8	2	3.8	2	2.7	0	0.0	133	48.9
Background information	5	3.6	0	0.0	4	5.3	0	0.0	9	3.3
Methodology	5	3.6	49	94.2	29	38.7	2	33.3	85	31.3
Comparative	0	0.0	0	0.0	37	49.3	1	16.7	38	14.0
Argumentative, speculative, hypothetical	0	0.0	0	0.0	2	2.7	3	50.0	5	1.8
Statistical data	0	0.0	1	1.9	1	1.3	0	0.0	2	0.7
Total	139	100.0	52	100.0	75	100.0	6	100.0	272	100.0

Management

The relations between citation type and location in the journal of management can be seen in Table 10. The percentage of citations that set the stage for the present study was comparatively high (64%) in the journal of management, which was the only discipline whose percentage exceeded 60% among all six disciplines discussed in this study. Unlike economists, who were found to care more about methods and materials, scholars of management focused more on literature reviews, tending to project the importance of their research questions by contrasting them with previous studies. Yet they still valued the implementation of research

methods from other studies, according to the second top percentage (17%) of methodological citations. Comparative, argumentative, speculative and hypothetical citations also appeared in the section of discussion, while comparative citations accounted for more percentage (11%) of total citations in the journal of management.

Table 10. Citations in Journal of Management by category and location.

Category \ Location	Introduction		Methodology & Materials		Results		Discussion		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Setting the stage	400	97.3	10	8.3	0	0.0	1	1.6	411	63.8
Background information	6	1.5	7	5.8	0	0.0	0	0.0	13	2.0
Methodology	5	1.2	90	75.0	11	22.4	3	4.7	109	16.9
Comparative	0	0.0	12	10.0	22	44.9	38	59.4	72	11.2
Argumentative, speculative, hypothetical	0	0.0	0	0.0	16	32.7	22	34.4	38	5.9
Statistical data	0	0.0	1	0.8	0	0.0	0	0.0	1	0.2
Total	411	100.0	120	100.0	49	100.0	64	100.0	644	100.0

Table 11. Citations in social science journals in Taiwan by category and location.

Category \ Location	Introduction (%)		Methodology & Materials (%)		Results (%)		Discussion (%)		Total (%)	
Setting the stage	89.87	3.07	0.45	0.27	56.3	89.87	3.07	0.45	0.27	56.3
Background information	5.37	3.9	4.33	0.85	4.85	5.37	3.9	4.33	0.85	4.85
Methodology	1.77	84.75	20.5	6.33	15.98	1.77	84.75	20.5	6.33	15.98
Comparative	0	3.1	45.68	46.12	12.88	0	3.1	45.68	46.12	12.88
Argumentative, speculative, hypothetical	0.17	0	26.85	45.73	7.12	0.17	0	26.85	45.73	7.12
Documentary	0.22	3.33	0.72	0.72	0.52	0.22	3.33	0.72	0.72	0.52
Historical	0.1	0	0	0	0.05	0.1	0	0	0	0.05
Statistical data	2.5	1.15	1.45	0	2.15	2.5	1.15	1.45	0	2.15
Casual	0	0.7	0	0	0.12	0	0.7	0	0	0.12
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In sum, the percentages of “setting the stage for the present study” citations ranked first in the journals of all six disciplines, with management accounting for 63.8%, psychology 58.6%, sociology 56.7%, political science 56.3%, education 53.5%, and economics 48.9%. The percentage of methodological citations to total citations was 15.2%, which made the second high among the six journals, with economics accounting for 13.3%, management 16.9%, and political science 15.4%. As for the comparative citations, psychology (17%) and sociology (14.6%) covered more than other disciplines, while education exceeded other disciplines in the argumentative, speculative and hypothetical citations, with a percentage of 16.8%.

In Peritz’s study, the citation type was highly relevant to the citation location, as confirmed by the results of this research shown in Table 11. In the introduction section, most citations belonged to the category of “setting the stage for the present study”; in the section of methods and materials, methodological citations appeared the most; as for the section of results and discussion, although the distribution of citation types varied among the six disciplines,

comparative, argumentative, speculative, and hypothetical citations were the most on the average. Overall, the research outcomes indicated that most social scientists of Taiwan complied with international writing format, and confirmed the hypothesis proposed by Peritz that the citation location was highly relevant to the citation type.

Summary and Discussions

This study explores and compares the distribution of article types of journals, languages of citation, citation years, document types of citations, citation types and locations of citations among citations in the top social science journals of six disciplines published in Taiwan and indexed in the Taiwan Social Sciences Citation Index (TSSCI). The following conclusions may be drawn from the results.

1. Journals and books were the most cited materials; English language articles were the most cited in social science studies in Taiwan.
2. Social scientists in Taiwan tended to cite materials published within the past 10 year, most citations in the sample journals were for articles with four to seven years of the journal publication, indicating that social scientists in Taiwan tend to cite the most recent articles.
3. The ratio of articles following IMRAD format was high in social science journal in Taiwan, suggesting that the top social science journals comply strictly with the IMRAD format of structured articles in Taiwan.
4. In Taiwan, citations in social science journals occurred the most in the introduction section, while the conclusions section had the least: The distribution of citations in different sections of an article may indicate the status and characteristics of a research domain. In this study, citations occurred most frequently in the introduction section for each of the social science disciplines. The introduction may include research background and literature review, and both sections need quite a few references for proving points or indicating motivation. For the methods section, economics and management had high percentage of citations, indicating that scholars in these two disciplines were used to adopting models, designations or operations from previously published research. In the results section, economists and psychologists tended to cite more articles for comparison and contrast. In general, citations appeared least frequently in the conclusions section, though the percentage rates were still a little higher in psychology and education, revealing their concern for further discussion and evaluation of research results.
5. Social scientists mostly cite to set the stage for their present studies: The “setting the stage for the present study” citations were the most frequently used in the sampled social science journals, accounting for 57.5% of all citations. From the distribution of citation type, it is clear that social scientists tended to cite in order to provide support or motivation for their own studies, which as shown by the large number of “setting the stage for the present study” type of citations. Scholars of economics, management and political science used to introduce methods and materials to compare or verify their findings. Psychologists and sociologists tended to compare their research results with previous studies, whereas scholars of education emphasized discussion greater than other sections.
6. Citation type is highly relevant to the citation location, which is consistent with the findings of Peritz’s study.

In this study, citation characteristics of social scientists in Taiwan were analyzed via bibliographic data such as types of cited materials and languages of citations. The results revealed the citation characteristics and information need of Taiwan’s social scientists, which could be valuable in collection development of libraries or refinement of information services. Under the assumption that citations indicate the actual use of materials, the distribution of publication years and citing half-life may serve as evidence for libraries to order or suspend

information resources (electronic journals, for instance), which could help to achieve similar goals on better budget allocation. Providing further exploration and examination of citations, this study is also expected to provide a better understanding of citation nature, and is anticipated to serve as a basis for future empirical studies.

There are limitations for the citation type determination by the textual analyst on the basis of the surrounding text. This is because, first, citation types may not be apparent simply by studying the text and, second, effective analysis sometimes requires specialist knowledge in the discipline of the texts being studied. Therefore, conducting an interview study with authors of the text to obtain their own views of citation types is suggested for further study. The small number of samples involved in this study preclude from making confident generalizations regarding the frequency of the citation types across these social science disciplines as a whole. Thus, the collection and analysis of a larger sample size is also suggested for further study.

Conclusion and Suggestion

The study is still to be improved owing to its restrictions and limitations. For better interpretation of the research trend, paradigm shifts and citation distribution of social sciences, it is suggested that the time frame, scope and quantity of sample collection be extended, including citations from both domestic and foreign articles. Co-research with experts and scholars in concerning disciplines are recommended as well. Even more, to reach a fuller apprehension of research features in academia by means of citation characteristics, samples in humanities and sciences may be examined in the future studies. Though Periz's classification scheme is known for its simplicity and directness, it is not quite suitable for those non-empirical studies. However, the Citation Content Analysis (CCA) framework proposed by Zhang, Ding and Milojevic (2013) may serve as solution to the problem, since it adopts both syntactic and semantic measurement of citation, which thus makes cross-field comparison possible. As for the essence of citation, the purposes and motives of citation are also valuable topics for further studying.

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