

The Cross-Citation Analysis of Selected Advertising Journals

CHIEN-HUANG LIN, CHIA-CHING TSAI

Department of Business Administration, National Central University

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ABSTRACT

The study analyzed the nature of cross-citation made and received among 11 selected leading journals in advertising discipline. In the study, we find that Journal of Consumer Research, Journal of Marketing Research and Journal of Advertising Research are the major journals and have a largest impact on the field of advertising. Besides, Multidimensional scaling, cluster analysis and sociometric method were used to analyze the communication patterns among these journals. A clear picture of the interaction patterns of selected major journals and the hierarchy of influence in advertising discipline was derived and these sample journals were also divided into four groups.

Keywords: citation analysis, advertising discipline, knowledge exchange, MDS, sociometric method

INTRODUCTION

It is beneficial to trace the communication pattern among leading journals in a discipline for appreciating the nature and development of the discipline. The prime contribution to the development of a discipline results from the articles of the journals published on the discipline. There are a lot of methods to measure the contribution of major journals to the development of a discipline. One way is to survey the rating of journals by academics and practitioners. Some authors surveyed the perceptions of academics and practitioners to evaluate the contribution of a journal to a discipline (Fry, Water and Scheurmann, 1985). However, this approach has its limitations (Jobber and Simpson, 1988) owing to that people report on what they believe to be true, not on what is objectively true (Jauch and Glueck, 1975). Another more objective way is to investigate the knowledge exchange among major journals in the discipline. Citation analysis is a useful way to examine knowledge exchange (Garfield, 1979). The analysis of citation made and received allows us to examine the knowledge exchange and diffusion among different disciplines, authors, institutions, and journals (Jackson & Ruthon, 1987). Citation analysis has been widely employed to empirically

investigate the structure of discipline and scholarly activities in many social and natural sciences. (Garfield, 1979) Despite having its limitations (Cote, Leong and Cote, 1991; Brown and Gardner, 1985), several scientists consider citation analysis to be the most objective available for assessing the impact of journal articles, institutions, and individuals (Brown and Gardner, 1985).

Citation analysis has been used in many fields such as economics (Billings and Viksnins, 1972; Skeels and Taylor, 1972); consumer research (Mittelstaed, 1990; Leong, 1989; Cote, Leong and Cote, 1991; Zinkhan, Roth and Saxton, 1992); accounting (Brown and Gardner, 1985); communication (So, 1988; Rice, Borgman and Reeves, 1988); marketing (Hamelmann and Mazze, 1973; Goldman, 1979; Robinson and Adler, 1981; Jobber and Simpson, 1988); management information system (Culnan, 1986); and advertising (Muncy, 1991; Lin, 1997). Therefore, citation analysis is not popularly being used in the field of advertising research. In the limited literature, Muncy (1991) investigated the citation patterns of *Journal of Advertising* in the year 1988 based on the citation report of SSCI. From the study, *Journal of Advertising* relies heavily on the disciplines of consumer behavior, marketing, and advertising. In terms of influencing other fields, *Journal of Advertising* has large impact on the fields of advertising, consumer research and marketing. Therefore, the same three fields, which *Journal of Advertising* cites most frequently, are also the three fields in which *Journal of Advertising* is most frequently cited. Lin (1997) employed citation analysis to assess the co-citation patterns between advertising research and other disciplines. Researches published in *Journal of Advertising Research* from 1981 to 1990 were selected as the data. The study indicated that advertising research plays a role of knowledge borrower rather than knowledge contributor, and found that advertising research has a great contribution on interdisciplinary cross-fertilization of ideas.

To compare with Muncy (1991) and Lin (1997), this study shows the communication patterns, a clear picture of the interaction patterns, the hierarchy of influence in advertising research and these advertising journals were divided into four groups. However, in Muncy (1991), we just can realize how the selected journal, *Journal of Advertising* communication with the disciplines, such as advertising, consumer research, marketing...and so on. In Lin (1997), we just can see the citation patterns between advertising research and other disciplines.

From the literature above, we can draw several conclusions. First, in the field of advertising research, citation analysis is not common and there are still fewer studies that can help us more completely understand the communication patterns among the selected advertising journals. Second, the number of journals covered in previous studies was few. For instance, in the study of Goldman (1979), he investigated only two journals, *Journal of Marketing Research* and *Journal of Marketing*. Moreover, some researches covered only one journal. Muncy (1991) investigated only one journal, *Journal of Advertising* in the year 1988 to analyze the citation patterns of *Journal of Advertising*. But, to trace the development of a discipline based on only one or two journals is not enough. Consequently, increasing the number of investigated journals is necessary to have a clear comprehension and appreciation of advertising research.

Therefore, the primary purpose of this study is to analyze the nature of cross-citation made and received among 11 selected leading journals in advertising field. Through the analysis of co-citation, we are able to figure out the more complete communication pattern and relationship among these major advertising journals and it can help us to understand the nature and the development of advertising research.

METHOD and DATA

In this study, we use citation analysis primarily to investigate the citation relationship among selected advertising journals. By way of the analysis of citations made to and received from selected advertising journals, we can figure out the communication pattern in advertising discipline.

Multidimensional scaling (MDS) was used to assess the position of each journal in the intradisciplinary network. MDS is a set of mathematical techniques that enable a researcher to uncover the “hidden structure” of data bases (Kruskal & Wish, 1978). The technique uses the proximity among any kind of objects as input. Proximity is a number that indicates how similar or how different two objects are. The chief output is a spatial representation, consisting of a geometric configuration of points, as on a map (Kruskal & Wish, 1978). From the study, we get a two-dimensional MDS map of co-citation patterns for the selected

advertising journals and it is a useful tool to assist us to figure out the relationship among journals.

Sociometric technique is a method used to analyze the interpersonal influential pattern, informal status and human relation. In this study, it was used to investigate the “interpersonal” relationship among these selected journals. By using Sociometric technique, researchers are able to analyze small groups in order to establish patterns of interactions among members. From such analysis, we can derive a hierarchy of influential inflow, and it can help us to assess the leading and influential role of each journal in the discipline.

Using the search term “advertising” to scour the Social Science Citation Index (SSCI) identified articles published during the years 1990-1997. These obtained articles in the way and their references are the database in the study. In order to get a more complete understanding, we elected eleven journals that include absolutely most of advertising researches from 1990 to 1997 as the samples of this study, not limited the sample to only one or two journals. The three selection criteria for journals are employed. First, the journal had to be included in SSCI from 1990 to 1997. Second, advertising is an important part of marketing, so marketing-related journals that contain a lot of advertising research are included in the study. Three, the purpose of advertising is to communicate with the consumers and advertising is often used as a media of mass communication, so journals about mass communication and discussing advertising frequently are chosen. Thus, there are 668 articles published in the selected journals and their references that come from the selected Journals were extracted as data. The eleven selected journals are in the following: Journal of Advertising, Journal of Advertising Research, Journal of Marketing, Journal of Marketing Research, Journal of Consumer Research, Advances in Consumer Research, Harvard Business Review, Public Opinion Quarterly, Journalism Quarterly, Marketing Science and Management Science. For the sake of convenience, in the study, we abbreviate them JA, JAR, JM, JMR, JCR, ACR, HBR, POQ, JQ, MrS, and MnS in turn.

RESULT

1.The Citation Characteristics of Selected Advertising Journals

Table 1 presents the general citation characteristics of 11 advertising journals for 1990-1997. The figures in Table 1 include the frequency of citation (citing & cited), self-citing openness and self-cited openness.

Table 1. The Citation Characteristics of Selected Journals

Characteristics	JCR	JMR	JM	JAR	JA	ACR	MrS	MnS	HBR	JQ	POQ
Citing	713	530	335	1591	1999	823	441	192	2	176	23
Cited	1510	1195	746	1087	896	521	294	178	125	162	111
Self-citing Openness	53.6 %	67.4 %	80.3 %	64.1 %	77.9 %	84.1 %	75.1 %	66.1 %	50%	72.2 %	69.6 %
Self-cited Openness	78.1 %	75.5 %	91.2 %	47.5 %	50.8 %	74.9 %	62.6 %	63.5 %	99.2 %	69.7 %	93.7 %
Impact Factor	1.374	1.722	2.431	0.324	0.518	0.185	1.478	0.905	2.230	0.913	1.085
Immediacy Index	0.222	0.289	0.276	0.211	0.000	--	0.237	0.063	0.556	--	0.100

Note: An ellipsis indicates that there are no data.

In this study, the meaning of the times citing is the reference number that the journal cites from the 11 investigated journals over the period of the 8 years under consideration. From Table 1, JAR and JA are the journals greater on the citing measure. It means that the articles about advertising published in both of these journals cite from these 11 journals more than the others do. That is, JAR and JA play roles of knowledge borrowers in the advertising field. On the contrary, HBR and POQ have a very smaller figure on the citing measure. That is, the references of the articles about advertising published in both of them are fewer from these 11 sample journals.

The times cited means the number that a target journal was cited from these 11 sample journals. It is a good indicator of the impact of journals. From Table 1, JCR, JMR and JAR are the journals cited most frequently in the sample journals of this study. That is, JCR, JMR and JAR are the major journals and have a largest impact on the field of advertising. They all play the roles of knowledge

contributors in advertising discipline. Especially, JAR is not only the knowledge contributor but also the knowledge borrower in the discipline of advertising.

Both the above findings are similar to the results of Muncy's (1991) study. It seems mean that the primary citation pattern of advertising discipline doesn't change in the period of 1990-1997. The special findings from the citing and cited rows in Table 1 are the articles about advertising published in MrS and MnS are not few from the 11 selected journals. And MrS, MnS, JQ, POQ and HBR have a lot of articles cited by the 11 sample journals. That is, advertising discipline also communicates frequently with MrS, MnS, JQ, POQ and HBR besides JCR, JMR, JM, JA, JAR and ACR.

Openness means the proportion of a journal's citations referring to outside publications thus indicating how "open" the journal is to the outside (So, 1988). Self-citing openness shows the proportion of a journal's citations referring to journals other than its own (So, 1988). Self-cited openness means the proportion of a journal's citations received not cited by itself. In this study, the major purpose is to assess the communication among selected advertising journals, so we define self-citing openness as the ratio of a journal's citation referring to journals other than its own of the samples journals. We also define self-cited openness as the ratio of a journal's citation received cited by journals other than its own of the sample journals.

In the self-citing openness row, JM and ACR are greater, but JCR and HBR are smaller. That means that JM and ACR make more citation from the selected journals other than themselves. However, JCR and HBR cite fewer from the studied journals other than their own. In the self-cited openness row, JM, HBR and POQ are greater, but JAR and JA are smaller. That means that JM, HBR and POQ receive more citation from the selected journals other than their own, but JAR and JA don't.

Impact Factor is a measure SSCI used to evaluate the significance of absolute citation frequencies (Garfield, 1990). In Table 1, JCR, JMR, JM, MrS, HBR and POQ have the greater measure. The impact factor of JCR is 1.374. It means that all articles in JCR received 1.374 citations in the subsequent two years. Alternatively, JMR received 1.722 citations, JM received 2.431 citations, MrS

received 1.478 citations, HBR received 2.230 citations and POQ received 1.085 citations.

Immediacy index measures how quickly an article in a particular journal is cited by existing journals (including its own). In Table 1, JCR, JMR, JM, JAR, MrS and HBR have greater immediacy index. The immediacy index of JCR is 0.222. It means that 22.2% of the articles of JCR are cited in the same year that they were published. Alternatively, JMR is 28.9%, JM is 27.6%, JAR is 21.1%, MrS is 23.7% and HBR is 55.6%.

2.The Communication Inflow Among Advertising Journals

Table 2 shows the overall pooled citation matrix of the 11 advertising journals for the years' 1990-1997. The total citation numbers of the 11 advertising journals are 6825.

Table 2. The Frequencies of Cross-Citation Among Journals

cited citing	JCR	JMR	JM	JAR	JA	ACR	MrS	MnS	HBR	JQ	POQ	Total
JCR	331	127	64	51	40	79	2	1	7	3	8	713
JMR	146	173	44	44	30	14	55	13	7	1	3	530
JM	89	59	66	35	41	18	9	3	10	2	3	335
JAR	182	188	195	571	222	70	32	19	62	29	21	1591
JA	445	298	241	233	411	200	25	17	25	67	37	1999
ACR	279	120	75	90	104	131	1	0	5	6	12	823
MrS	22	170	34	35	1	4	110	60	3	0	2	441
MnS	8	40	6	9	4	1	59	65	0	0	0	192
HBR	0	0	0	0	0	0	1	0	1	0	0	2
JQ	7	17	16	18	43	3	0	0	5	49	18	176
POQ	1	3	5	1	0	1	0	0	0	5	7	23
Total	1510	1195	746	1087	896	521	294	178	125	162	111	6825

A brief overview of Table 2, the most frequencies of cross-citation of JCR, JMR, JAR, MnS, JQ and POQ are all from themselves. That of JM, JA and ACR

are all from JCR, and MrS is from JMR. That means that JCR, JMR, JAR, MnS, JQ and POQ communicate most frequently with themselves. JM, JA and ACR communicate most frequently with JCR, and MrS communicates most frequently with JMR.

According to the pooled citation matrix (Table 2), a matrix of the total number of citations, the sum of citations made and received during the eight-year period, is derived and depicted in Table 3. And Figure 1, a two-dimensional MDS map of co-citation relationship for the 11 advertising journals is constructed with Table 3.

Table 3. The Total Frequencies of Citation Among Journals

Frequency	JCR	JMR	JM	JAR	JA	ACR	MrS	MnS	HBR	JQ	POQ
JCR	331										
JMR	273	173									
JM	153	103	66								
JAR	233	232	230	571							
JA	485	328	282	455	411						
ACR	358	134	93	160	304	131					
MrS	24	225	43	67	26	5	110				
MnS	9	53	9	28	21	1	119	65			
HBR	7	7	10	62	25	5	4	0	1		
JQ	10	18	18	47	110	9	0	0	5	49	
POQ	9	6	8	22	37	13	2	0	0	23	7

3.The Analysis of Citation Pattern using MDS

MDS was used to investigate the position of 11 advertising journals in the communication inflow system of advertising discipline. Moreover, based on the similarity of citation pattern, cluster analyses was employed to cluster the 11 advertising journals into 4 groups. Figure 1 was constructed according to the ALSCAL multidimensional scaling program in SPSS.

Goodness of fit is a very important consideration in deciding how many dimensions are appropriate. "Stress" is a measure of fit widely used in MDS and it is the square root of a normalized "residual sum of squares" (Kruskal and Wish, 1978). Stress measures the proportion of the variance of disparities that is not accounted for by the MDS model (Hair, Anderson, Tatham, and Black, 1992).

Generally speaking, the lower the stress, the better the fit. The study uses Kruskal's stress, the most common measure to determine the goodness of fit of the model (Hair, Anderson, Tatham, and Black, 1992).

RSQ is another index of fit. It is a squared correlation index that can be interpreted as indicating the proportion of variance of the disparities accounted for by the multidimensional scaling procedure. It measures how well the raw data fit the MDS model (Hair, Anderson, Tatham, and Black, 1992). Contrary to stress, the higher the RSQ, the better the fit. Generally, it can be considered to accept when RSQ is tantamount to or greater than 0.6 (Hair, Anderson, Tatham, and Black, 1992).

The stress and RSQ of Figure 1 are 0.17517 and 0.87732. In terms of RSQ and goodness of fit, Figure 1 can be accepted.

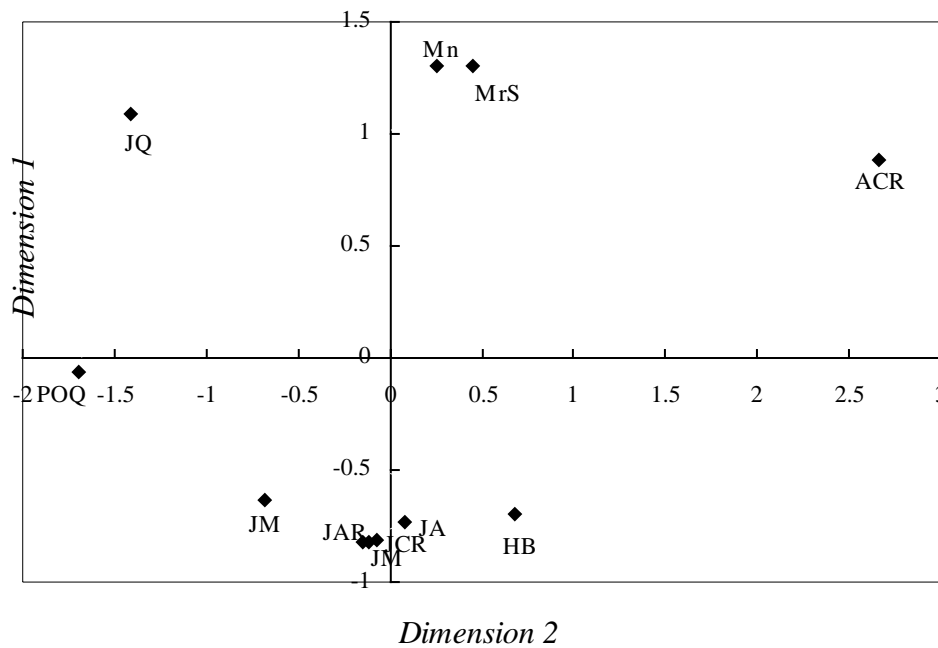


Figure 1. MDS map

Figure 1 presents a two-dimensional MDS map of co-citation relationship for the 11 advertising journals. The map is constructed with the sum of citations made and received as a measure of communication intensity. Journals that appear close together tend to cite each other frequently, while those farther apart are more

impossible to cite each other. According to Figure 1, JCR, JM, JAR, JA, JMR and HBR communicate frequently, and so do MnS and MrS.

As revealed in Figure 1, most of the 11 journals are positioned in the lower side of the MDS map. There are only four journals located in the upper side.

The MDS map shows clearly the informal networks existing among advertising discipline. Advertising journals exchange knowledge with one another within the networks. The exchanges among journals are the foundation for the “invisible colleges” in a discipline (Noma, 1984).

Furthermore, cluster analysis is employed to identify the clusters of selected journals that reveal similar co-citation patterns in their communication with others. According to Table 4, the coefficient increased dramatically from 4 groups to 3 groups (from 1.414138 to 4.394130). Thus, the ideal number of clusters is 4 groups. The first cluster is composed of JCR, JMR, JM, JAR, JA and HBR. They all have good reputations and longer histories. The second cluster includes POQ and JQ. Both of them belong to quarterly. The third cluster is only made up of ACR. It focuses on the extension of consumer research. The fourth cluster is consisted of MnS and MrS. They both emphasize the scientific techniques.

Table 4. The Coefficient of Cluster Analysis

The Number of Groups	Coefficient	Increase
10	0.000779	--
9	0.003930	0.003151
8	0.042072	0.038142
7	0.045759	0.003687
6	0.420045	0.374286
5	0.836108	0.416063
4	1.414138	0.578030
3	4.394130	2.979992
2	4.581298	0.187168

In summery, we can draw some conclusions from the MDS analysis and cluster analysis. First, JCR, JMR, JM, JAR, JA and HBR have a similar pattern in citation received and citation made. Second, POQ and JQ have a similar citation pattern. Third, MnS and MrS have a similar pattern in citation received and citation made. Forth, the citation pattern of ACR is not similar to any other journals.

4.The Analysis of Communication Inflow Using Sociometric Method

Sociometric method has been exercised in all sorts of ways for many purposes. It is used popularly to assess people and to investigate informal status (Hodgetts, 1982). It attempts to evaluate people by collecting the judgments of other people, organizational peers, or subordinates. The technique usually does not require the judges (usually peers) to provide a rationale for their judgment (Leavitt & Bahrani, 1988). The study regards these journals as peers, and employs sociometric method to assess the “interpersonal” relationship. Journals play two kinds of roles: sending role or receiving role. We use the cited/citing ratio to identify the role played by each journal because cited/citing ratio is useful way to evaluate the impact of journals over time (Zinkhan, Roth & Saxton, 1992). When the cited/citing ratio to another journal is greater than 1, the target journal plays a knowledge sending role. Quite the opposite, when the cited/citing ratio is less than 1, the target journal plays a knowledge-receiving role. In terms of Lin (1995), “sending index” is to figure out the sending/receiving status in the communication pattern among journals. Sending index is the number of journals investigated which their cited/citing ratio is greater than 1. The sending index in the study ranges from 0 to 10. The value of 0, the minimum means that the target journal does not play a sending role to any other journals. The value of 10, the maximum means that the target journal plays a sending role to all the other 10 journals. The cited/citing ratio and sending index are both depicted in Table 5.

Table 5. The Cited / Citing Ratios of citation Among Journals

Target Journals	JCR	JMR	JM	JAR	JA	ACR	MrS	MnS	HBR	JQ	POQ
JCR	1	0.87	0.72	0.28	0.09	0.28	0.09	0.13		0.43	8
JMR	1.15	1	0.75	0.23	0.10	0.12	0.32	0.33		0.06	1
JM	1.39	1.34	1	0.18	0.17	0.24	0.26	0.5		0.13	0.6
JAR	3.57	4.27	5.74	1	0.95	0.78	0.91	2.11		1.61	21
JA	11.13	9.93	5.88	1.05	1	1.92	25	4.25		1.56	
ACR	3.53	8.57	4.17	1.29	0.52	1	0.25	0		2	12
MrS	11	3.09	3.78	1.09	0.04	4	1	1.02	3	0	
MnS	8	3.08	2	0.47	0.24		0.98	1	0	0	0
HBR	0	0	0	0	0	0	0.33	0	1	0	0
JQ	2.33	17	8	0.62	0.64	0.5	0	0		1	3.6
POQ	0.13	1	1.67	0.05	0	0.08	0	0	0	0.28	1
Sending Index	8	7	7	3	0	3	1	3	8	3	6

According to the sending index in Table 4, we describe the hierarchy of influence in advertising disciplines in figure 2. JCR and HBR (sending index = 8) are the leading influential journals in the communication pattern of the 11 advertising journals. They played a leading and important role in the structure of knowledge communication. The second level includes JMR, JM and POQ (sending index = 7 or 6). The third level includes JAR, ACR, MnS and JQ (sending index = 3). The fourth level includes MrS and JA (sending index = 1 or 0).

Based on the concept of sociometric method and the previous four levels of influence, Figure 2 is sociometric map as the output of Table 4. The Figure shows the influential relationship among 11 advertising journals. For the sake of simplicity, we just indicate the influential relationship existing between the level journals and the below level. That is, the influential relationship between 1st level and 3rd level, 1st and 4th level, and 2nd level and 4th level are not shown in Figure 2. In accordance with Figure 2, we can realize clearly the hierarchy of the dissemination of advertising knowledge existing.

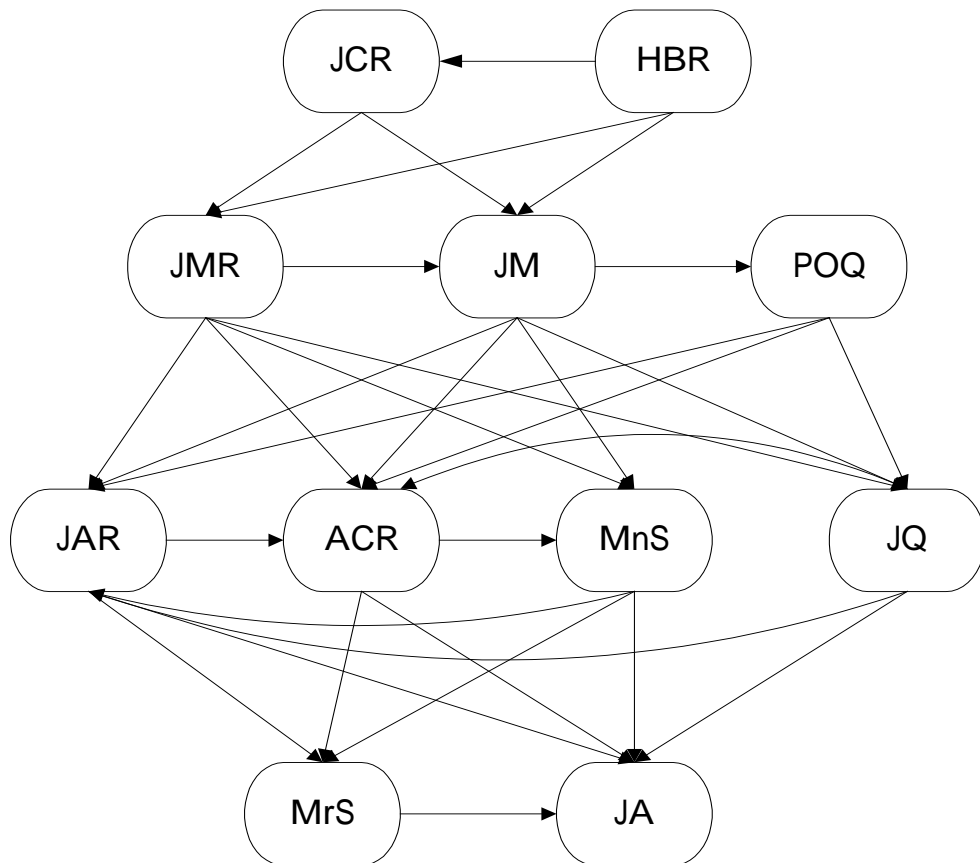


Figure 2. The Hierarchy of Influence

DISCUSSION

This present study of the cross-citation analysis of advertising journals indicates that the advertising discipline has a communication inflow structure. By citation analysis, this study finds that Journal of Consumer Research, Journal of Marketing Research and Journal of Advertising Research are the major journals in advertising discipline. Especially, Journal of Consumer Research plays a significant knowledge-contributor role to all the other journals. As additional evidence of the influence, the self-citing openness of Journal of Consumer Research is smaller. Besides, Journal of Advertising Research and Journal of Advertising play the roles of knowledge borrowers.

The MDS map (Figure 1) derived shows a clear picture of communication pattern. Journal of Consumer Research, Journal of Marketing, Journal of Advertising Research, Journal of Advertising, Journal of Marketing Research and Harvard Business Review communicate frequently, and so do Management Science and Marketing Science. Through cluster analysis, the selected journals are divided into 4 groups. Journal of Consumer Research, Journal of Marketing Research, Journal of Marketing, Journal of Advertising Research, Journal of Advertising and Harvard Business Review are the first cluster, and all have good reputations and longer histories. Public Opinion Quarterly and Journalism Quarterly are the second cluster, and they are both quarterly. The third cluster only includes Advances in Consumer Research focusing on the extension of consumer research. The fourth cluster includes Management Science and Marketing Science both emphasizing the use of scientific techniques.

To sum up, Journal of Consumer Research, Journal of Marketing, Journal of Advertising Research, Journal of Advertising, Journal of Marketing Research and Harvard Business Review communicate frequently, and Journal of Consumer Research, Journal of Advertising Research and Journal of Marketing Research are prime journals in advertising disciplines among them. Especially, Journal of Consumer Research is the most significant journal. It plays a knowledge-contributor role. Besides, Journal of Advertising Research and Journal of Advertising.

There are some limitations in this study. First, in this study, we only select 11 advertising journals as sample. To assess a complete comprehension of the development and communication patterns of advertising research, including more journals or extending the period of database in future study is necessary. Second, some working papers that have ever been cited in the period of 1990-1997 are eliminated. The future researchers can take it into consideration.

As another topic of further research, to investigate whom are the leading authors in advertising field and what subjects they are good at may be benefic. To probe into what are the mainstreams of advertising and how they evolve is also very favorable. Besides, it may be beneficial to trace the co-citation among different articles. These studies will help us realize how advertising was formed and they are some of worthwhile further researches.

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中央大學企業管理學系

摘要

本研究主要選擇廣告學科中，較為重要的主要期刊探討他們彼此間的相互引證情形。經由此一分析可讓我們對廣告學科的發展及其間的知識交流有一相當的認識。本研究所根據的是 SSCI 資料庫，共選取十一本廣告相關的期刊為主要探討對象。本研究發現 *Journal of Consumer Research*, *Journal of Marketing Research* 與 *Journal of Advertising Research* 在廣告學科中扮演者極重要的角色，此外，本研究亦根據社會計量法得到這十一本廣告相關期刊間的相互影響圖像，也是一幅廣告知識傳播的層級圖。最後，本研究以多元尺度法及集群分析法根據此十一本期刊間的相互引證情形歸類為四類。

關鍵詞彙：引證分析，銷學科，知識交流，多元尺度法，社會計量法