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Intellectual activities and influences of Belver C. Griffith: A citation perspective

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Based on an analysis of the 377 documents that cited Griffith's publications in the ISI citation databases, it has been found that Griffith made pioneer and significant contributions with his collaborators to the fields of bibliometrics and scholarly communication among scientists. His research work has also greatly influenced people from all over the world conducting research in psychology, bibliometric information science, and social studies of science in the past several decades.

Introduction

I learned of the passing away of Belver C. Griffith, my doctoral advisor at Drexel University, when I was attending the 1999 American Society for Information Science annual meeting. The terrible news shocked me because Dr. Griffith and I had a very pleasant phone conversation only several months ago. It was also sad for me to think that a great mind has ceased working since many people have greatly benefited from his ideas, thoughts and guidance in academia. I, as one of his students, have always been extremely grateful "for his intellectual inspiration and guidance" – the wording I put in the dedication of my dissertation to him in 1991. (*Chu*, 1991)

When asked to write an article for the Griffith memorial issue of *Scientometrics*, I believed, after some thinking, that an examination of his intellectual activities and influences using citation data would seem to be pertinent and appropriate. The data collection was done first in May and then in August 2000 by searching on "Griffith BC" as a cited author across SciSearch, Social SciSearch, and Arts & Humanities Search, the DIALOG version of the Institute of Scientific Information's (ISI) citation databases. The search retrieved 377 unique records in which one or more Griffith's publications were cited. The 377 citing documents were then processed and analyzed for getting the data ready for this project. In the current writing, I will first present Griffith's

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intellectual activities as viewed from the perspective of citation data, followed by an exploration of his influences on other scholars and researchers.

Griffith's major contributions to the intellectual world

In their memorial article for Griffith, *White* and *McCain* (2000) portrayed a cocitation map of Griffith with other 51 authors in two interrelated fields: science studies and bibliometric information science. According to the citation data I collected for this project, 43 different publications of Griffith's were cited. Table 1 lists his publications that were cited 4 times or more. Detail bibliographical information about his top 9 highly cited publications is also provided in Table 1 to help the reader better understand Griffith's main scholarly contributions.

Among Griffith's top 9 highly cited documents, 3 (#1, #4 & #6) deal with science studies, 3 (#2, #3 & #8) belong to bibliometric information science, and 2 (#7 & #9) cover both fields. The remaining publication in the group, i.e., # 5, is related to psychology in which Griffith received his education and training. Looking beyond the top 9 highly cited publications recorded in Table 1, it still can be seen that Griffith focused his research mainly in the areas of psychology, social study of sciences, bibliometrics, and information science.

As noted earlier, some citing authors cited two or more of Griffith's publications in their papers. So the total number of citations to Griffith's publications by the 377 citing papers exceeds far beyond 377. Furthermore, the citation frequency would be much higher if ISI had not merely indexed first authors when compiling its citation databases. There are a considerable number of research reports Griffith authored but in which he was not listed as the first author. These works nevertheless hold the same importance as, if not greater than, those he wrote as the first author.

Griffith's influences on the intellectual world

Throughout his academic career of several decades, Griffith collaborated with and guided many others. "He has been a productive researcher and scholar on information issues from 1961 to 1997. " (*White* and *McCain*, 2000, p. 960) His works have been widely cited when other people explore the scientific world, especially in areas of bibliometrics and scholarly communication among scientists. Below is the examination of Griffith's intellectual influences on others from the subject, geographical as well as temporal perspectives.

Table 1
Highly cited publications of Griffith

Cited publication of Griffith	Citation frequency	Cumulated frequency
#1 Griffith, B.C., and Mullins, N. (1972). Coherent social groups in scientific change. *Science, 177,* 959-965.	108	108
#2 Griffith, B.C., Small, H., Stonehill, J.A., and Dey, S. (1974). The structure of scientific literatures II: Toward a macrostructure and microstructure for science. *Science Studies, 4,* 339-365.	100	208
#3 Griffith, B.C., Servi, P.N., Anker, A.L., and Drott, M.C. (1979). Aging of scientific literature – Citation analysis. *Journal of Documentation, 35,* 179-196.	53	261
#4 Griffith, B.C., and Miller, A.J. (1970). "Networks of informal communication among scientifically productive scientists". In: C.E. Nelson, and D.K. Pollock (Eds.). *Communication among scientists and engineers* (pp. 125-140). Lexington, MA: Heath.	24	285
#5 Griffith, B.C., Spitz, H.H., and Lipman, R.S. (1959). Verbal mediation and concept formation in retarded and normal subjects. *Journal of Experimental Psychology, 58,* 247-251.	15	300
#6 Griffith, B.C., Jahn, M.J., and Miller, A.J. (1971). Informal contacts in science: A probabilistic model for communication processes. *Science, 173,* 164-166.	13	313
#7 Griffith, B.C. (Ed.). (1980). *Key papers in information science.* White Plains, NY: Knowledge Industry.	12	325
#8 Griffith, B.C., Drott, M.C., and Small, H. (1977). On the use of citations in studying scientific achievements and communication. *Society for Social Studies of Science Newsletter, 2,* 9-13.	10	335
#9 Griffith, B.C. (1990). "Understanding science: Studies of communication and information." In: C.L. Borgman (Ed.). *Scholarly communication and bibliometrics* (pp. 31-45). Newbury Park, CA: Sage Publications.	10	345
GRIFFITH BC, 1979, V31, P381, ASLIB PROCEEDINGS	9	
GRIFFITH BC, 1986, V37, P261, JASIS	9	
GRIFFITH BC, 1988, V13, P351, SCI TECHNOL HUMAN VALUES	9	
GRIFFITH BC, 1976, 1ST P INT C SOC STUDIES	7	•
GRIFFITH BC, 1984, V6, P5, SCIENTOMETRICS	6	•
GRIFFITH BC, 1958, V63, P247, AM J MENT DEFICICENCY	5	•
GRIFFITH BC, 1966, V9, P3, AM BEHAVIORAL SCI	5	
GRIFFITH BC, 1973, DESCRIBING COMMUNICA	5	
GRIFFITH BC, 1974, PERSPECTIVES INFORMA	4	
GRIFFITH BC, 1977, CURRENT CONTENTS	4	
GRIFFITH BC, 1979, V16, P254, P ASIS ANNUAL MEETING	4	
GRIFFITH BC, 1981, V32, P344, JASIS	4	
GRIFFITH BC, 1983, STOCKHOLM PAPERS LIB	4	
GRIFFITH BC, 1983, V38, P255, J DOC	4	
Total:	424	424

A Subject View

The ISI citation databases list subject type for citing journals along with other kinds of information. For example, *American Sociological Review* is assigned the subject type of "Sociology" while *Scientometrics* is classified under "Information Science and Library Science". Table 2 shows the subject type and corresponding frequency for the citing journals that carry the 377 citing documents.

Table 2
Distribution of citing journals by subject type

Journal subject type	Frequency	Percentage
Information Science & Library Science	190	50.4
Sociology	37	9.8
Social Sciences, Interdisciplinary	26	6.9
History & Philosophy of Science	16	
Psychology	15	10.9
Education & Educational Research	10	
Physics	9	
Communication	8	
Anthropology	7	
Social Issues	6	12.5
Language & Linguistics	5	
Social Sciences, Mathematical Methods	5	
Multidisciplinary Sciences	4	
Geography	3	
All Other Journal Subject Types (frequency < 3)	36	9.5
Total:	377	100

As can be seen from Table 2, "Information Science and Library Science" accounts for over 50% of all the citing journal subject types. "Sociology" and "Social Sciences, Interdisciplinary" cover about 10% and 7% of the citing journals in terms of subject type. A closer examination also reveals that the three journal subject types labeled "Social Sciences, Interdisciplinary", "History & Philosophy of Science" and "Multidisciplinary Sciences" could reasonably be merged to form a new category named "Social Studies of Science" or "Science Studies" as coined by *White* and *McCain* (2000) in their paper.

From the citation viewpoint, Griffith's intellectual influences on others' scholarly activities typify his research interests and match well with his own account as well as the personalized map presented by *White* and *McCain* (2000). In addition to the journal subject type, citing journal titles themselves can also indicate subject areas of the 377 citing papers included in the current study. Table 3 lists individual citing journals that carried 3 or more citing documents for this study.

Table 3
Distribution of citing journals by title

Journal title	Frequency	Percentage
Scientometrics	55	15
Journal of the American Society for Information Science	35	9
Current Contents	15	
Journal of Documentation	15	
Library Trends	11	16.6
Social Studies of Science	11	
Annual Review of Information Science & Technology	10	
Czechoslovak Journal of Physics	9	
Information Processing & Management	9	
Proceedings of the ASIS Annual Meeting	8	
American Sociological Review	7	
Journal of Information Science	6	
Science Technology & Human Values	6	
Kölner Zeitschrift fur Soziologie und Sozialpsychologie	5	
Science Studies	5	23.6
American Journal of Mental Deficiency	4	
Communication Research	4	
Knowledge-Creation Diffusion Utilization	4	
Library & Information Science Research	4	
Nachrichten fur Dokumentation	4	
American Journal of Sociology	3	
Library and Information Science	3	
Library Quarterly	3	
Nauchno-Tekhnicheskaya Informatsiya Seriya 1- Organizatsiya …	3	
Social Science Information Studies	3	
All Other Titles (frequency < 3)	135	35.8
Total:	377	100

A total of 134 individual journals were used to publish the 377 citing papers included in this study. *Scientometrics* and *Journal of the American Society for Information Science* are the two journals ranked at the top in the list of journals contained in Table 3. Other titles with a usage frequency of 10 or higher (i.e., *Current Contents*, *Journal of Documentation*, *Library Trends*, *Social Studies of Science*, and *Annual Review of Information Science & Technology*) all appear familiar publications in library and information science or social studies of science. Table 3 again shows, from a difference angle, that Griffith's influences on other researchers extend from information science to social study of science with the innovative use of the bibliometric approach.

A Geographical View

Although Griffith was affiliated with American institutions in his academic career, he did research and consulting work in other countries such as Russia, England, Sweden and the Netherlands. Furthermore, his publications have been widely cited by researchers from all over the world. Table 4 presents the country/region information extracted from the author affiliations listed in the 377 citing documents.

The citing authors covered in this study are from 26 countries and regions according to the affiliation information. The majority of the citing authors lives and works in U.S.A, which results naturally from Griffith's nationality and the leading role U.S.A. plays in the scientific world. As exhibited in the raw citation data, Hungary is ranked high among the countries listed in Table 4 partly because *Scientometrics* is published there and a number of the journal's editors are Hungarians. On the other hand, one author from Czechoslovakia (J. Vlachy) wrote all the 10 citing papers published in that country and collected for this study. Obviously, Griffith's research is not only interdisciplinary but also international in terms of scholarly influences.

A Temporal View

As mentioned before, Griffith was prolific and productive as a researcher. His publications are often consulted and cited by other people. Figure 1 shows the distribution of citing documents by publication year.

The first citation to Griffith's research was recorded in 1972 when Social SciSearch began its publication. The peak citation period spans about 15 years (mid 1970s – late 1980s), which approximately synchronizes with the golden time of Griffith's research life. There appears a dip in the year of 1990 as far as the number of citations is concerned. The exact reason for that dip does not seem clear and obvious to the current writer. However, Griffith's health around 1990 could be one of the possible factors that lead to the dip of citation.

Table 4
Distribution of citing authors by country

Country/Region	Frequency	Percentage
U.S.A.	244	64.7
England	30	8
Germany[1]	16	
Netherlands	12	13
Hungary	11	
Czechoslovakia	10	
Canada	8	
Russia[2]	6	
Belgium	4	
France	4	
Japan	4	
Spain	4	14.3
Australia	3	
Brazil	2	
Denmark	2	
Finland	2	
India	2	
Israel	2	
Singapore	2	
Sweden	2	
Switzerland	2	
Iran	1	
New Zealand	1	
Scotland	1	
Taiwan, China	1	
Yugoslavia	1	
Total:	377	100

[1] Germany includes both the former East Germany and West Germany.
[2] Russia includes the former Soviet Union.

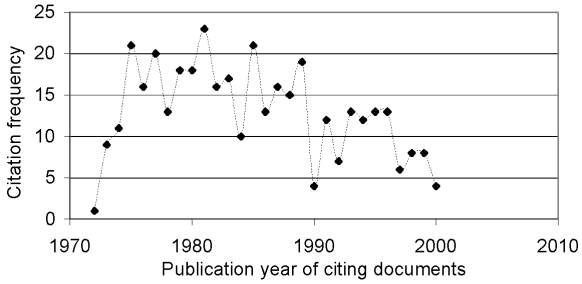

Figure 1. Distribution of citing documents by publication year

In addition, one citation tendency emerges when the 377 citing documents are sorted by publication year and then by journal subject type: Citations in early to mid 70s mainly go to Griffith's works in psychology, scholarly communication, and social studies of science. Starting from late 70s, an increasing number of citations were made to Griffith's publications in bibliometrics and information science related areas (e.g., evaluation of bibliographic information systems). That citation pattern more or less mirrors the research paths Griffith took in his academic career.

Concluding remarks

In retrospective, Griffith explored such fields as psychology, scholarly communication, social studies of science, bibliometrics, and evaluation of bibliographic retrieval systems in his decades long research profession. His contributions to science studies and bibliometric information science are indeed pioneer and significant. The analysis of the 377 citing papers gathered for this study also demonstrates the strong national and international influences of his publications on the intellectual world, particularly in the areas of bibliometrics and scientific communication among researchers. Griffith's seminal work will no doubt continue to inspire and motivate other scholars in their future research endeavors.

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