

ARE METHODOLOGICAL PAPERS MORE CITED THAN
THEORETICAL OR EMPIRICAL ONES?
THE CASE OF SOCIOLOGY

B. C. PERITZ

*Graduate School of Library and Archive Studies,
Hebrew University, Jerusalem, P.O.B. 503, 91904 (Israel)*

(Received September 2, 1982)

The objective of this study is to find out whether methodological papers published in core sociological journals are more frequently cited than theoretical or empirical (substantive) papers. The results indicate that such is indeed the case; moreover, this result is not due to a few "outlying", very highly cited papers. These findings are based on all the methodological and theoretical papers, and a sample of the empirical papers, published in 1972 and 1973 in three high-impact sociological journals. The citation counts for these papers were compiled from the *Social Science Citation Index* for the years 1972-1981. The data were analyzed separately for each journal and year of publication.

Introduction

Are papers dealing with methodological issues more frequently cited than other papers? The question is of interest both intrinsically and because its answer may identify a confounding variable which needs to be controlled in comparative citation analyses. *Garfield*¹ discusses the issue at some length. In chemistry theoretical and methodological papers dominate in the lists of most frequently cited papers.²⁻³ However, it is not clear whether the "ordinary", non-exceptional, methodological paper also fares better than the average paper. Furthermore, to our knowledge, no such study has been carried out for any of the social sciences.

It seemed useful to carry out an investigation of this type for sociology, for two reasons: a) the field has a considerable literature of self-examination with regard to growth, use, publication patterns, citations, etc. of its scientific output (a few of the relevant papers are mentioned in the next section); and b) both methodology and theory are areas of major interest to most working sociologists.

The main purpose of this paper is to look at the following hypothesis: methodological papers tend to be more frequently cited than both empirical and theoretical papers. It is also hypothesized that this difference is not due merely to a few exceptional papers with very high citation counts.

The above hypothesis will be investigated here only in regard to papers published in high impact, "general" sociological journals. Since theoretical and methodological problems often are relevant to more than one subfield of sociology, it is not clear whether, and how, the specialized journals could be included in such a study.

Methods

The sociological journals selected for this study are: the *American Sociological Review (ASR)*, the *American Journal of Sociology (AJS)* and *Social Forces (SF)*. These are, according to the *Social Science Citation Index Reports, 1979*,⁴ the three general (i.e. non-specialized) sociological journals with the highest impact factors; in 1979 these factors were, respectively: 3.0, 2.2, and 1.0. Their ranks among all social science journals were 13, 35, and 155, respectively. Earlier studies had recognized these as the journals most valued by sociologists⁵ and most cited in core journals.⁶ Other bibliometric studies were based on the same three journals,⁷⁻⁸ with the possible addition of *Rural Sociology*,⁹⁻¹⁰ or on the first two among them.¹¹

The years of publication chosen for the source papers were 1972 and 1973. According to the *Social Science Citation Index Reports, 1979*, this is still within the "half-life" for these journals (more than 10 years), a finding confirmed by our data (see, Results). Nevertheless, it was felt that, if one were to take even earlier years of publication for the source papers, one's results might be affected by long-term trends.

The basic classification of papers was similar to that of *Brown and Gilmartin*.¹¹ The main categories of papers under study were: methodological, theoretical and empirical.

The first category contains papers dealing with methods of study design, data collection, and analysis. Papers that use empirical data in order to illustrate or demonstrate methodological points were included in this group.

The second category contains papers that discuss concepts and general theoretical schemata. It corresponds generally to group 12 in the classification of *Brown and Gilmartin*.

The third category includes all investigations which use empirical data of whatever source or nature. It corresponds to category 2 "studies presenting substantive research" in the *Brown-Gilmartin* classification.

The body of papers to be studied included only "ordinary" journal articles: book reviews, notes, commentaries, debates-including author's replies-were excluded from the outset. A total of 314 papers was thus left for investigation. From this population all papers that did not fit well into these basic categories were also excluded:

Thirteen papers dealing with the history of sociology and the history of social and political ideas. These papers had to be excluded since a citation of them might conceivably be a proxy for reference to the original literature they deal with.

Five papers which make both substantive and methodological points.

Eleven papers which are concerned with both substantive and theoretical conceptual developments.

It is, of course, realized that nowadays most empirical papers are grounded on some body of theory and use methods of some sophistication. However, only in the few papers mentioned above the main thrust of the paper was substantive as well as theoretical or methodological.

Twenty-one papers were found to be unclassifiable for several reasons. This group included, "impressionistic" analyses of anecdotal material as well as a variety of papers that did not really report on new research: essays, literature reviews, invited addresses, state of the art papers and the like.

This process of exclusion left the following numbers of papers:

Theoretical	: 52
Methodological:	36
Empirical	: 176

Of the latter a random sample of about one third was taken, separately from each of the three journals, thus leaving 62 empirical papers in the analysis. The total number of papers analyzed thus amounted to 150 papers.

Citations to each of the 150 papers were identified in the yearly volumes of the *Social Science Citation Index*¹² for every year from 1972 to 1980, as well as in the first issue of 1981 – the last available to the author at the time of writing.

Results

The basic data on the number of papers and numbers of times they were cited are given in Table 1. The 150 papers studied were cited 3339 times.

Table 2 gives the frequency distribution of the papers by the numbers of times they were cited. Clearly, the citation counts of the methodology papers were much higher than those of the other two categories. Almost one half, 47% of the methodology papers were cited twenty times or more, as against less than one third in the other two categories. At the other end of the scale, about 20% of the methodology papers were cited less than ten times, against about 40% of the other two categories – remarkably few papers have remained uncited.

The comparison of the frequencies in Table 2 does not control for the potentially confounding variables: the journal and the year of publication. In particular, the fact that methodology papers are relatively less frequent in *Social Forces*, the least cited of the three journals, needs to be taken into account. This will be done in the next two tables.

B. C. PERITZ: ARE METHODOLOGICAL PAPERS MORE CITED

Table 1
Papers in study and numbers of times cited, by journal, year and category

Journal	Theoretical		Methodological		Empirical		Total	
	Papers	Times cited	Papers	Times cited	Papers	Times cited	Papers	Times cited
ASR 1972	10	238	7	366	14	363	31	967
ASR 1973	8	125	10	212	9	149	27	486
Total	18	363	17	578	23	512	58	1453
AJS 1972	10	189	4	263	8	165	22	617
AJS 1973	8	232	9	236	12	357	29	825
Total	18	421	13	499	20	522	51	1442
SF 1972	10	80	1	18	9	127	20	225
SF 1973	6	33	5	86	10	100	21	219
Total	16	113	6	104	19	227	41	444
Grand Total	52	897	36	1181	62	1261	150	3339

Table 2
Papers in study by category and number of times cited

Number of times cited	Theoretical	Methodological	Empirical	Total
0	2	—	2	4
1-9	17	7	24	48
10-19	18	12	17	47
20-29	8	5	7	20
30-39	1	5	4	10
40 +	6	7	8	21
Total	52	36	62	150

Table 3 presents the mean numbers of times the papers were cited; according to their category, journal and year of publication. Since means are sensitive to outlying observations, they were also recalculated after exclusion of the latter. "Outliers" were arbitrarily defined as papers with 80 or more citations. The means obtained after exclusion of the outliers are given in brackets.

There were six outlying papers: 3 in methodology (all by the same author), 2 empirical and one theoretical. They accounted for 42%, 20%, and 11% of the citations to methodological, empirical, and theoretical papers, respectively.

The main findings are: on the average, methodological papers were cited more often than theoretical and empirical papers of the same journal and year, whether or not out-

Table 3
Mean * number of times cited, by journal, year and category

Journal	Theoretical	Methodological	Empirical
<i>ASR</i>			
1972	23.8	52.3 [30.3]	25.9
1973	15.6	21.2	16.5
<i>AJS</i>			
1972	18.9	63.8 [24.0]	20.6 [11.3]
1973	29.0 [19.4]	26.2 [15.0]	29.8 [17.7]
<i>SF</i>			
1972	8.0	18.0	14.1
1973	5.5	17.2	10.0

*In brackets: means without outliers

Table 4
Median number of times cited, by journal, year and category

Journal	Theoretical	Methodological	Empirical
<i>ASR</i>			
1972	19.5	26	22.5
1973	13	13.5	8
<i>AJS</i>			
1972	15	30	8.5
1973	19	14	13.5
<i>SF</i>			
1972	5.5	18	11
1973	5.5	19	6.5

liers are excluded from the calculations. The only exception to this are the means for the *American Journal of Sociology*, 1973, where there is little difference between the three categories. Altogether there is very little difference between the means of theoretical and empirical papers. *Social Forces* is cited somewhat less often than the other two journals.

When dealing with skewly distributed variables it is often more instructive to look at medians rather than means. In the present instance the medians (presented in Table 4) confirm the findings on the means.

The dispersion of the citation data can be judged from Table 5, which gives standard deviations by category, journal and year. Again, the standard deviations after exclusion of outliers are given in brackets. The outliers have, of course, a big effect on the stand-

B. C. PERITZ: ARE METHODOLOGICAL PAPERS MORE CITED

Table 5
Standard deviation* of number of times cited, by journal, year and category

Journal	Theoretical	Methodological	Empirical
<i>ASR</i>			
1972	20.68	60.74 [19.48]	17.72
1973	9.44	19.44	13.97
<i>AJS</i>			
1972	14.16	83.96 [10.82]	27.61 [8.67]
1973	32.41 [19.25]	35.13 [10.72]	45.43 [19.02]
<i>SF</i>			
1972	8.14	- **	14.18
1973	3.45	10.52	13.61

*In brackets: standard deviations without outliers

** One paper only

Table 6
Number of times papers were cited by category, year of publication and calendar year

Year of publication	Theoretical				Methodological				Empirical			
	1972		1973		1972		1973		1972		1973	
Year of citation	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1972	2	0.4	—	—	7	1.1	—	—	7	1.1	—	—
1973	31	6.1	4	1.0	20	3.1	9	1.7	34	5.2	6	1.0
1974	44	8.7	21	5.4	52	8.0	38	7.1	68	10.4	28	4.6
1975	57	11.2	45	11.5	76	11.7	64	12.0	100	15.3	100	16.5
1976	74	14.6	55	14.1	80	12.4	73	13.7	93	14.2	96	15.8
1977	60	11.8	48	12.3	92	14.2	92	17.2	92	14.0	60	9.9
1978	60	11.8	53	13.6	102	15.8	81	15.2	90	13.7	72	11.9
1979	68	13.4	73	18.7	90	13.9	82	15.4	81	12.4	85	14.0
1980	74	14.6	56	14.4	94	14.5	68	12.7	70	10.7	112	18.5
1981	37	7.3	35	9.0	34	5.3	27	5.1	20	3.1	47	7.8
(Jan.—April)												
Total	507	100	390	100	647	100	534	100	655	100	606	100

ard deviations. After their exclusion no systematic difference is found between categories or journals.

It must be noted that the above data refer to papers which are, mostly, still in the midst of their citation careers. As shown in Table 6, there is no indication that the number of citations to these papers (which were published 7–9 years before the closure of data collection) is diminishing. Consequently, there is no way of ascertaining whether the three categories differ in regard to their ‘half-life’.

The citation counts used in this study include author self-citations. The *Social Science Citation Index* allows one to distinguish only those instances of self-citation in which the *first* author of the citing paper was one of the authors of the cited paper. The number of these self-citations was low and they were unlikely to affect the main findings. The numbers and percentages, by category, were as follows: methodological 45 (4.3% of citations), empirical 81 (6.4% of citations) and theoretical 39 (4.3% of citations). In toto there were 165 such self-citations, or 4.9% of all citations.

The two hypotheses under consideration here are:

a) that methodological papers tend to be cited *more often* than theoretical papers and b) that they tend to be cited *more often* than empirical papers. To test these hypotheses on the basis of our "samples" the Mann-Whitney statistics for each journal and year of publication were combined according to *Van Elteren's* method.¹³ The results were as follows:

Methodological versus theoretical $z = 1.92$ $P = 0.027$

Methodological versus empirical $z = 1.85$ $P = 0.032$

Discussion

The present survey indicates that methodological papers tend indeed to be more cited than theoretical or empirical papers. Furthermore, this is not only due to a few highly cited papers – although three such studies were present in our sample. On the technical side the implication of this finding is that, in comparative citation analyses, it will sometimes be necessary to control for the "category" (methodological or other) of the papers under study. On the substantive side the implication is that the methodological papers published in the main core journals of sociology are being widely used.

It must be emphasized that these findings are only a first step in the investigation of methodological inputs into the literature of the social sciences. Thus, one would like to know something on the impact of the methodological papers published in other fields and about the extent to which the citations to such papers step across disciplinary boundaries. The investigation of the impact of monographs, collective works, and periodicals devoted to methods of research would also be of interest. Finally – and perhaps most importantly – one should not assume that all references to points of methodology come from works devoted exclusively to methods. It might well be that essentially empirical, or even theoretical, papers are often cited with regard to some question of method. This subject could be investigated by looking in depth at the *role* of the citations vis-a-vis the source article, along the lines suggested by *Lipetz*,¹⁴ *Hodges*,¹⁵ *Moravcsik* and *Murugesan*,¹⁶ and *Spiegel-Rösing*.¹⁷

The way a discipline relates to problems of research methodology is an important aspect of its intellectual climate. The present paper is intended to provide a starting point for citation – analytic investigations of this aspect in the social sciences.

References

1. E. GARFIELD, *Citation Indexing – Its Theory and Application in Science, Technology, and Humanities*, John Wiley, New York, 1979, p. 244–246.
2. H. G. SMALL, Characteristics of Frequently Cited Papers in Chemistry, Philadelphia, Institute for Scientific Information, 1974, Final Report on Contract n. NSF–C 975.
3. E. GARFIELD, A List of 100 Most Cited Chemical Articles, *Current Contents*, 10 (9 March 1977) 5–12.
4. *Social Science Citation Index Reports*, 1979, Institute for Scientific Information, Philadelphia, 1980.
5. N. D. GLENN, American Sociologists' Evaluations of Sixty-Three Journals, *American Sociologist*, 6 (1971) 289–303.
6. N. LIN, C. E. NELSON, Bibliographic Reference Patterns in Core Sociological Journals, 1965–1966, *American Sociologist*, 4 (1969) 47–50.
7. M. OROMANER, The Career of Sociological Literature: A Diachronous Study, *Social Studies of Science*, 7 (1977) 126–132.
8. M. OROMANER, The Diffusion of Core Publications in American Sociology, *Journal of the American Society for Information Science*, 28 (1977) 34–37.
9. N. PATEL, Collaboration in the Professional Growth of American Sociology, *Social Science Information*, 12 (1973) 77–92.
10. M. OROMANER, Collaboration and Impact: The Career of Multi Authored Publications, *Social Science Information*, 14 (1975) 147–155.
11. J. S. BROWN, B. G. GILMARTIN, Sociology Today: Lacunae, Emphases, and Surfeits, *American Sociologist*, 4 (1969) 283–291.
12. *Social Science Citation Index* (1972–1981).
13. P. Van ELTEREN, On the Combination of Independent Two Sample Test of Wilcoxon, *Bulletin de l'Institut International de Statistique*, 37 (1960) 351–361.
14. B. A. LIPETZ, Improvement of the Selectivity of Citation Relationship Indicators, *American Documentation*, 16 (1965) 81–90.
15. T. L. HODGES, Citation Indexing: Its Potential for Bibliographic Control, Berkeley, University of California, Ph. D. Dissertation, 1972, p. 143.
16. M. J. MORAVCSIK, P. MURUGESAN, Some Results on the Function and Quality of Citations, *Social Studies of Science*, 5 (1975) 86–92.
17. I. SPIEGEL–RÖSING, Science Studies: Bibliometric and Content Analysis, *Social Studies of Science*, 7 (1977) 97–113.