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Current Comments®

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To What Extent Is the Research Literature Cited? Lowell Hargens and David Bott Examine Citation Rates in Sociology

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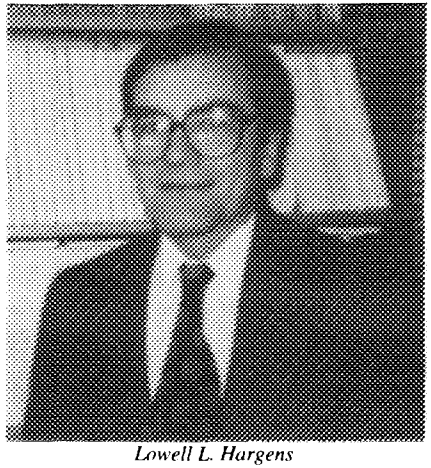
Introduction

A tempest in a test tube was stirred up a few years ago when David Hamilton, a reporter for *Science*, used ISI® data to assert that 55 percent of 1981 papers were uncited five years after publication. He coyly asked whether the data suggest "that more than half...of the scientific literature is essentially worthless."[1] In a follow-up report, he noted that uncitedness rates in the social sciences averaged 75 percent, and 98 percent in the arts and humanities.[2]

These claims received national attention, and a *Newsweek* report explicitly stated, "The implication is that nearly half the scientific work in this country is basically worthless."[3] In the same report, Rustum Roy, Pennsylvania State University, State College, was quoted as saying research scientists are "welfare queens in white coats."[3]

But this controversy assumes that uncitedness is a stigma.[4] When all is said and done, very little is known about what uncitedness means or even the significance of being cited once. So much is published today that it is virtually a mathematical certainty that not everything will be cited. Not being cited does not necessarily mean the paper hasn't been read. Also, it says nothing about the paper's usefulness in teaching, for example, rather than research. There is also the phenomenon of delayed recognition or premature discovery— there are examples of works that went uncited for several years after publication but have since become recognized as landmark contributions.[5]



Lowell L. Hargens

Setting the Record Straight

As it turns out, Hamilton's claims were based on a series of incomplete and misleading interpretations of the data. For one, the data were not limited just to original research papers. Rather, they included all so-called journal "source items"—book reviews, obituaries, proceedings abstracts, letters to the editor, editorials, and other items not likely to be cited subsequently. Also, different fields have different citation characteristics. For example, the average biochemistry paper will likely be cited within a few years after publication, while a mathematics paper may need 10 or more years. In addition, the journal citation rates in the social sciences and arts and humanities tell only part of the story, because books remain perhaps the most important means of

scholarly communications in these fields. These and other critical comments were made in a series of letters to *Science*.[6-14]

These points are obvious to experienced information specialists knowledgeable about the uses—and abuses—of citation data for scientometric analyses. They should be obvious also to inexperienced nonspecialists who venture into citation analysis, provided they search and read the extensive literature on the subject before they play Sorcerer's Apprentice with the data. For these reasons, we have frequently devoted *Current Comments*® essays to the advantages and limitations of citation data for a variety of purposes—research policy making and administration, national and institutional performance comparisons, faculty evaluation, and so on.[15-17]

Case in Point: The Sociology Literature

Another way to correct the unfortunate negative impressions left by flawed reporting is to highlight well-designed, well-executed citation analyses by responsible and professional authors. A good example is the reprint that follows, by Lowell L. Hargens, Ohio State University, Columbus, and David M. Bott, University of Illinois, Urbana-Champaign. It is an abridged version of a paper on citation rates of sociology papers, edited book chapters, and books from the summer 1991 issue of *The American Sociologist*.[18]

Not surprisingly, Hargens and Bott found citation rates that deviated significantly from what Hamilton reported. Of 553 journal papers published in 1974, only 9 percent were uncited through 1985. When they examined the two *least*-cited journals in their database, they found that two-thirds of their papers were cited after six years—compared to the 23 percent cited rate that Hamilton reported for *all* sociology journals after four years. Also, 70 percent of the 33 edited book chapters in their sample were cited after 11 years. And 96 percent of 113 books were cited through 1985.

About the Authors

Current Contents® readers may recall Hargens from a previously reprinted survey coauthored with Howard Schuman, University of Michigan, Ann Arbor, on the impact of citation indexes on biochemists and sociologists.[19] Hargens received his PhD in sociology from the University of Wisconsin, Madison, in 1971 and has been a faculty member at the University of Washington, Seattle, Indiana University, Bloomington, and the University of Illinois. He is currently a professor of sociology at Ohio State. His primary research area is the sociology of science, and he is a founding member of the Society for the Social Studies of Science. Bott is a PhD candidate at the University of Illinois.

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Are Sociologists' Publications Uncited? Citation Rates of Journal Articles, Chapters, and Books

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Abstract

Critics argue that few sociological publications are cited in the subsequent literature and that this implies many are superfluous. Data on the number of citations to three kinds of sociological documents—journal articles, chapters in edited books, and books—show that a substantial majority of each type is cited in the subsequent literature. Furthermore, the high proportions of ever-cited items do not result from authors' citation of their own work. The average book is cited about as often as an average article in a highly cited journal, while an average chapter in an edited book is cited about as often as an average article in an infrequently cited journal. Within-journal variation in article citation rates far exceeds between-journal variation.

Critics frequently disparage academics' publications by pointing to studies that suggest many published articles are never cited. Recently, Hamilton (1990) reported data from the Institute for Scientific Information® (ISI®) indicating that 55 percent of a cohort of papers published in the journals indexed by ISI received no citations during the five years after publication. On the basis of this result, he suggested that a majority of published papers are "essentially worthless." More recently, Hamilton (1991) claimed that sociology articles are substantially less likely to be cited by the end of four years after publication than articles in many other disciplines. For example, sociology's proportion of uncited papers (77 percent) was reportedly over twice that of physics (37 percent).

Many view such results as evidence that today's journal literature is "an ocean of unread and unreadable articles" (Broad and Wade, 1982: 222). They usually attribute this condition to a vicious cycle in which scholars, under pressure to publish, promote the establishment of new journals until the total supply of journal space far exceeds the amount needed to print all worthy

papers. As a result, much unworthy work allegedly finds its way into print. Once again, sociology is often portrayed as an extreme manifestation of these trends. The editors of *The New Republic* (1987), for example, recently identified sociology as a field in which many superfluous journals have been established, and sociologists themselves have argued that so many sociological journals exist that the field is losing whatever intellectual integration it formerly had (Turner and Turner, 1990).

The recent claims about triviality of sociological journal articles, as measured by the proportion that are never cited, are noteworthy in part because of their inconsistency with a previous study of the citation histories of sociology articles. Peritz (1983) studied a sample of papers published by the *American Sociological Review*, the *American Journal of Sociology*, and *Social Forces* during 1972-73, and found that only 4 of 150 papers were uncited during 1972-81. Unfortunately, Peritz's sample overrepresented articles with theoretical and methodological as opposed to empirical foci, and her results probably underestimate the proportion of never-cited papers in the three journals she studied. In addition, these three journals are usually numbered among the most prestigious sociology journals, and articles they publish are probably more likely to be cited than those published by less prestigious sociology journals. Nevertheless, Peritz's finding that only 3 percent of the papers in her sample were uncited during the decade after publication seems inconsistent with Hamilton's claim that 77 percent of sociology articles are uncited four years after publication.

In this paper we present a more complete assessment of the extent to which articles in sociological journals are cited. Our research examines citation histories of papers published in 21 journals of varying prestige so that we can study variation in subsequent citations within and between journals. Our study also examines the citation histories of a cohort of books. Given the prominence of books in sociology articles' reference lists (Line, 1981), it is surprising that no one has studied this issue. Although the overall number of citations to books in the social sciences is greater than the number to journal articles, we do not know to what extent the average book is cited. Indeed, Line (1981) and Griffith and Small (1983) reported that behavioral-science citations to the monographic literature are quite concentrated; books by a few "classic" authors, such as Karl Marx and Sigmund Freud, receive huge numbers of citations while most other books receive few. Thus, it is possible that books by contemporary authors receive relatively little scholarly attention.

Researchers studying scholarly productivity usually assume that a book represents a substantially greater contribution than a journal article. For example, in constructing an overall index of research productivity, Brown (1967) set a book as equivalent to 10 articles, and Blau (1973) weighted books as equal to 5 articles. The practice of weighting books more heavily than articles seems to be based primarily on such facts as that they typically contain more pages than articles and that they take longer to write. There are reasons to question the assumption that a book constitutes a significantly greater scholarly contribution than an article, however. Publishing houses frequently make decisions about submitted monographs on the basis of market considerations in addition to assessments of potential scholarly importance, and particularistic ties between editors and prospective authors play an important role in selection procedures (Powell, 1985). As a result, it is possible that published books may be uncited by subsequent scholarship. By examining the citation histories of a cohort of books, we seek to determine whether they are less likely to be uncited than journal articles, and to assess the validity of assuming that a book constitutes a significantly larger scholarly contribution than an article.

A third major form of publication in sociology is chapters in edited books. Our study, therefore, also examines the citation histories of a cohort of such papers. Edited volumes are a heterogeneous lot, ranging from prestigious and rigorously peer-reviewed books to collections of papers presented at a conference with little or no sub-

sequent editorial quality control. Our data provide information on both the average citation rate of chapters in edited books and the variation in the distribution of their citation rates.

Data and Methods

We began by constructing sampling frames for each of the three kinds of sociological publications. So that we would have at least 10 years of citation data, while taking advantage of the quinquennial cumulative *Social Sciences Citation Index®* (*SSCI®*) published by ISI, we chose to study documents published during 1974. For journal articles, we selected a purposive sample of 21 journals to provide a rough coverage of the range of journals Allen (1990) studied. Specifically, we included the "big 3" sociology journals (*American Journal of Sociology*, *American Sociological Review*, and *Social Forces*), 13 other sociological journals (*Acta Sociologica*, *British Journal of Sociology*, *Demography*, *Journal of Marriage and the Family*, *International Journal of Comparative Sociology*, *Pacific Sociological Review* [later retitled *Sociological Perspectives*], *Social Problems*, *Sociological Analysis*, *Sociological Inquiry*, *Sociological Methods and Research*, *Sociology and Social Research*, *Sociology of Education*, and *Theory and Society*), and 5 interdisciplinary social science journals (*Administrative Science Quarterly*, *Behavioral Science*, *Human Organization*, *Law and Society Review*, and *Social Science Quarterly*). From the 1974 issues of each of these journals, we drew simple random samples of approximately 30 articles or research notes. We excluded errata, comments and rejoinders, book reviews, etc. from our samples. We included all articles and research notes from the few journals that published fewer than 25 during 1974.

We used the 1975 and 1976 issues of the book review journal *Contemporary Sociology* as a sampling frame for sociological books published in 1974. After listing all books published in 1974 that were reviewed in those issues, we excluded edited books, books in their second or subsequent editions, and introductory level textbooks. From the remaining 327 books, we selected a simple random sample of 113.

To sample articles in edited books published in 1974 we again drew upon the 1975 and 1976 issues of *Contemporary Sociology*. We began with the list of edited books reviewed in these issues and then excluded those which reprinted previously published articles, mostly "readers" produced for instructional purposes. From each of the 33 edited volumes that met our criteria, we randomly selected a single article.

Our three samples included a total of 699 documents. We examined the 1971-75, 1976-80, and 1981-85 *SSCI* compilations to determine how often each document had been cited between 1974 and 1985. We searched for many of the errors that scholars make in referring to others' work (erroneous volume and page numbers, common misspellings of authors' names, errors in authors' first and middle initials, etc.), and are confident that we missed only a small number of the citations to sampled publications. Some of the citations that books receive are book reviews, and since our sampling frame for books was a book-review journal, all the books in our sample received at least one such citation. Because our object was to gauge the extent to which material in books is used in subsequent research, we excluded book-review citations. We included authors' self-citations in our citation counts because we wanted to measure all subsequent use of a given document.[1]

Results

We began by reporting general characteristics of the distribution of citations to the 553 journal articles we studied. Between 1974 and 1985, these articles were cited 7,915 times, for an average of 14.3 citations per article. However, the distribution of citations to the journal articles is positively skewed: the median article was cited five times, and the modal article only once. These results are consistent with numerous studies showing that distributions of citations to both journal articles and individual scholars are positively skewed (Allison and Stewart, 1974; Price, 1976).

Table: Characteristics of distributions of citations to journal articles, books, and articles in edited books, 1974-1985 *SSCI*®.

A. Journal Article

Journal	Median	Mean	S.D	% Cited after 1 yr.	% Cited after 6 yrs.	% Cited after 11 yrs.	N
Administrative Sci. Quart.	36.5	38.8	28.0	67	100	100	30
American Sociological Rev.	33.0	41.3	30.7	79	100	100	29
Law and Society Rev.	22.0	46.3	59.5	68	100	100	19
American J. Sociology	18.0	28.0	28.8	87	97	97	30
Social Problems	12.0	13.3	10.2	35	97	97	31
J. Marriage and Family	8.0	18.4	24.9	37	90	93	30
Social Forces	8.0	10.7	11.8	54	93	96	28
Demography	6.5	14.8	19.2	70	97	97	30
Behavioral Science	6.0	20.8	48.2	47	87	90	30
Sociological Meth. and Res.	6.0	10.0	11.7	48	90	95	21
Sociology of Education	6.0	7.6	7.9	44	89	93	27
Theory and Society	5.0	6.3	7.1	57	95	100	21
Sociological Inquiry	4.5	7.8	9.5	32	77	82	22
Pacific Sociological Rev.	4.0	3.8	3.9	37	74	81	27
Human Organization	3.0	4.9	5.8	26	74	84	31
Social Sci. Quart.	3.0	5.6	10.7	28	76	83	29
Sociology and Social Res.	3.0	4.4	4.2	29	71	89	28
British J. Sociology	2.5	3.3	3.5	20	73	87	30
Sociological Analysis	2.0	3.0	3.1	36	68	84	25
Acta Sociologica	1.0	2.3	3.1	30	65	75	20
Int. J. Comparative Sociol.	1.0	1.3	1.4	7	67	73	15
B. Articles in Edited Books	1.0	5.3	8.9	27	64	70	33
C. Books	18.0	41.4	63.9	65	96	96	113

Only 9.2 percent of the 553 articles were uncited between 1974 and 1985, a proportion three times that Peritz reported for the three journals she studied, but much lower than Hamilton's results suggested. In fact, our data show that 45.4 percent of the articles were cited by the end of 1975, and 85.4 percent by the end of 1980, whereas Hamilton claimed that only 22.6 percent of sociology articles published in 1984 were cited by the end of 1988.

What accounts for the substantial difference between our results and Hamilton's? Two possibilities that probably do not account for the difference are (1) that the journals in our study are substantially more highly cited than those the *SSCI* indexes, and (2) that articles published in the mid-1970s were more highly cited than those published in the mid-1980s.

Data bearing on the first possibility appear in the upper panel of the table, which shows the proportion of uncited papers in each of the 21 journals in our study. The two least-cited journals in our study, *Acta Sociologica* and the *International Journal of Comparative Sociology*, have long been among the least-cited sociology journals indexed by the *SSCI* (see the annual rankings of sociology journals by their "impact factors" contained in the annual *Journal Citation Reports*® (*JCR*®) published in conjunction with the *SSCI*.[2]) Yet our data show that about two-thirds of the articles in these two journals were cited by the end of six years after publication, a far cry from the 22.6 percent figure Hamilton reported for *all* sociology journals four years after publication.

It is also unlikely that articles in sociology journals were cited much less frequently in the 1980s than they were in the 1970s. The impact factors for sociology journals reported in the *JCR* over the years it covers suggest little change during that period. For example, the median impact factor for the 75 sociology journals covered by the 1979 *SSCI* equalled .29 while the corresponding figure for the 67 covered by the 1988 *SSCI* equalled .33 (the means for the two years were .44 and .45, respectively).[3] Thus, it is doubtful that temporal

change in citation rates for sociology articles can account for the great disparity between our findings and Hamilton's.

One likely source of at least part of the difference between the two sets of findings is the fact that Hamilton's results are based on computer-matching routines. Such programs are likely to miss some citations to individual papers because they cannot correct for all of the errors that scholars make when citing previous work. As noted above, we checked for such errors when we inspected the *SSCI* for citations to the documents in our study, and although we suspect that we still missed some of the citations we sought, we are confident that we found citations that a computer matching routine would miss.

A second and more important source of the difference is Hamilton's misidentification as "research articles" of what ISI calls "source items" (Abt, 1991; Pendlebury, 1991). ISI source items include such rarely cited items as book reviews, editorials, and commentary about previously published papers. Including these items in a study of uncitedness will obviously lead to a misleading overestimate of the extent to which *research articles* are uncited.[4]

It is possible that we find so few uncited papers within 11 years of publication because many papers are cited only by their authors. We therefore determined the proportion of papers that received only first-author self-citations[5] among the subsample of 396 papers discussed in note 1. Surprisingly, just four of these papers, 1 percent, received only first-author self-citations. Our data reveal that papers receiving these self-citations tended to receive citations from other authors, suggesting that the high probability of being cited does not result from scholars citing their own undistinguished work.

The distributions of citations to the articles in each of the journals in the table are, with the possible exception of *Administration Science Quarterly*, positively skewed.[6] Thus, the positive skew of the overall distribution did not result solely from differences in the journals' average citation levels. The standard deviations shown for the journals in the table tend to be large—in 17 of the 21 cases they exceed the journal's mean. To get a summary picture of the extent to which variation in article citations is composed of within- and between-journal variation, we calculated a one-way analysis of variance using the journals as categories of the independent variable. We found that 73 percent of the variance in article citations was within journals; thus, there is roughly three times as much variation within journals as between them.

The table also shows that a substantial majority of articles in all 21 journals have been cited by six years after publication. For most journals the proportion of never-cited papers did not drop much over the last five years covered by our data. This is largely a "floor effect," given the low proportions of never-cited papers in most journals after six years. The eight journals whose articles were least likely to have been cited after six years show some additional decrease over the last five years, but much less than during years two through six. In general, one can predict fairly accurately which papers will be uncited by the end of 11 years on the basis of their citations at the end of 6 years.

A final notable result for the journals in the table is that, excluding the *American Sociological Review*, the *American Journal of Sociology*, and *Social Forces*, articles published in specialty journals, such as the *Journal of Marriage and the Family*, *Demography*, and *Sociological Methods and Research*, tend to be more highly cited than journals with a broader compass, be they journals published by professional associations, such as *Sociological Inquiry* and the *Pacific Sociological Review*, or by foreign or interdisciplinary groups, such as *Acta Sociologica* and *Social Science Quarterly*. It will be necessary to collect data on a broader sample of sociology journals to determine whether this is a general pattern or just an accidental characteristic of the particular journals in our sample. But it points to the interesting possibility that sociologists' work is more visible to others in their specialty journals than to equally prestigious general journals.

Turning to the question of how often articles in edited books are cited, section B

of the table shows that in terms of median citations over the 11-year period, chapters in edited books are tied with the two lowest journals in our study. In addition, the proportion of chapters ever cited by 11 years after publication is lower than the proportion shown by any journal. As we noted earlier, however, edited books are a heterogeneous category. This heterogeneity is best measured by a scale-invariant measure of inequality, such as Allison's "modified coefficient of variation" (Allison, 1980).[7] The mean value of this coefficient for the 21 journals in our study equals 1.09, but for the chapters in edited books it equals 1.62, indicating that the citation heterogeneity of papers in edited books is considerably greater than that of papers in a typical journal. In our data the most-cited paper in this category was published by the rigorously reviewed *Sociological Methodology 1973-1974*; it was cited 40 times over the following 11 years, twice as often as the second most-cited chapter.

Section C in the table shows the results for our sample of 113 books. On the basis of either the median or mean 11-year citation counts, one would conclude that the average book is equivalent to a single article in one of the top sociology journals. Once again, however, this is obviously a heterogeneous category—Allison's modified coefficient of variation equals 1.54 for the books we studied. Four percent were uncited between 1974 and 1985, while the most-cited book, Erving Goffman's *Frame Analysis*, garnered nearly 350 citations, substantially more than any other book, chapter, or journal article in our study.[8] This suggests that although the *average* book receives about as many citations as an average paper in a top journal, the extra length of books, and the extra effort that presumably goes into writing them, may qualify authors for a "competition" whose reward is an extremely high citation level. However, our data indicate that few books succeed in this competition.

Discussion

Our results show that the great majority of sociological publications, be they books, papers in edited books, or journal articles, are subsequently cited. The proportion of uncited papers in most of the journals in our study is lower than 10 percent, and only 30 percent of the least-cited type of publication, chapters in edited books, are uncited. Furthermore, our data indicate that those relatively high probabilities of receiving at least one citation are not due to authors frequently citing their own work; instead, publications that are cited by their authors are also likely to be cited by others. Thus, these results seriously challenge claims that the sociological literature is largely "an ocean of unread and unreadable articles."

Of course, there is tremendous variation in average rates of being cited. We find, for example, that median citation levels of the most-cited journals in our study are over 30 times those of the lowest. The range of median citation levels for journals also encompasses that of books, whose median citation rate is close to the top of the range for journals, and articles in edited books, whose median is at the bottom.

Two further points about our analysis bear emphasis. First, one should not lose sight of the substantial variation in citations *within* each of the journals in this study and among both books and chapters in edited books. We noted that about three quarters of the variance in journal article citations is within-journal variance; when we expanded that analysis to include two additional categories, books and chapters in edited books, the proportion of the total variance in citations that was within-category variance increased to 91 percent. Thus, one can obtain only a relatively small amount of information about how often a sociological document is cited from knowing what kind of document it is and where it appeared.

Second, readers should not construe our examination of citation histories as an argument that citation performances are the sole criterion on which to judge the value of various kinds of sociological documents. Writing and publishing articles and books can advance many goals in addition to that of obtaining citations from one's colleagues, and many of these goals do not necessarily

result in citations (Garfield, 1991). For example, Charles Darwin wrote to a fellow geologist that books are a poor vehicle of communication and that "the only object in writing a book is a proof of earnestness, and [to give proof] that you do not form your opinions without undergoing labor of some kind." (Darwin, 1887: 303). Thus, we would be reluctant categorically to advise freshly minted sociology Ph.D.s, who often face a dilemma in deciding what to do with their theses, that their best strategy is to rewrite their results as articles for prestigious general journals. Our results suggest that placing two or three chapters in top-ranked journals will probably garner more citations from colleagues than turning one's thesis into a book, but academic tenure committees may count a book as more than two or three articles. Perhaps the underlying rationale for the differential weighting flows from the "proof of earnestness" that a book confers; in choosing the option that costs more time and produces less recognition from colleagues, the fledgling academic shows that she or he is willing to work long hours for little reward. Administrators will obviously value this trait, but so too will peers who hold an image of scholarship that prizes industry and modesty over the energetic pursuit of attention.

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NOTES

1. We examined the frequency of self citations for a subsample of 396 articles from those included in our study. Of the 5,946 citations to these articles, 6 percent were self-citations. Peritz (1983) reported that 5 percent of the citations to the 150 papers in her study were self-citations. These results indicate that self-citations constitute a relatively small proportion of all citations.
2. The ISI "impact factor" is the quotient of the total number of citations in year t to articles published in a journal in years t-1 and t-2 divided by the number of articles that journal published in years t-1 and t-2. Although the impact factor measures the average number of citations to recently published articles in a given journal, Allen (1990) showed that they are highly correlated with estimates of the average number of citations ever received by articles in a given journal.
3. One might have expected changes in the composition of *JCR*'s sociology category to lower the average impact factor of the category. Twenty-six of the 75 journals listed as sociology journals in the 1979 *JCR* were not included in the 1988 *JCR* sociology list, and most of them were journals that *JCR* listed in more than one disciplinary category in 1979 but listed in only one category in 1988. Well-known journals in demography, criminology and penology, and family studies were especially likely to be moved from the sociology listing. *JCR* added 18 journals to the sociology category during the period, many of them newer publications such as *Symbolic Interactionism* and *Journal of Mathematical Sociology*. Because one would expect relatively young journals to be cited less than older ones, these changes should have produced lower citation rates in 1988 than in 1979. The similarity in the average journal impact factors at these two times is therefore strong evidence against the claim that sociology journal articles were less cited in the 1980s than in the 1970s.
4. Furthermore, misidentifying source items as research articles will exaggerate disciplinary differences in uncitedness because book reviews and commentary on previous papers are more prevalent in the humanities and social sciences than the physical sciences. Although we do not have conclusive data on the issue, we believe that the differences in research article uncitedness between the physical and social sciences are much smaller than those Hamilton reported. For example, compare our results with those reported by Abt (1991).
5. The ISI citation indexes list only the first author of a paper citing a previous paper. Thus we could not examine the extent to which second or subsequent authors cite their previous work. Sixty-six percent of the papers in our study had a single author, however, and given the low proportion of first-author self-citations reported in footnote 1, we doubt that data on self-citation that included all authors would materially change the results we report.

6. The coefficient of skewness, which equals zero for symmetric distributions (Nie et al., 1975: 184-85), is positive and at least twice its standard error for all journals except *Administrative Science Quarterly*, where it is positive but less than its standard error.
7. This coefficient equals $\frac{\sqrt{Var(x)}}{\bar{x}}$. Allison (1980) shows that it has both theoretical and technical advantages over other measures of citation inequality.
8. Three other books received between 250 and 300 citations and four more between 150 and 250. Of the 553 journal articles in our sample, the most cited received 259 citations, the second highest 246, and the third 130. Thus, 7 percent of the books in our sample received more than 150 citations while less than .5 percent of the journal articles did so.

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