

The “Centrality” of Journals in Sociology

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In my analyses of the quality of journals in sociology (*Footnotes* November 1990; December 2003), I defined the “core influence” of a journal in terms of the number of times that an article published in that journal might expect to be cited in the three “core” journals in sociology: *American Sociological Review*, *American Journal of Sociology*, and *Social Forces*. Operationally, the core influence of a journal is measured by the number of times it is cited by these three journals divided by the number of articles it has published in that time period. This measure has the virtues of being highly interpretable and relatively easy to compute. However, it may appear, at first glance, to be somewhat arbitrary because it focuses solely on the number of times that a journal is cited by three other journals. Indeed, the validity of this measure depends on whether these three “core” journals are, in fact, the most “central” journals of the discipline.

An objective assessment of this issue requires the application of network analysis. The flow of citations to and from journals can be viewed as an exchange network. A journal is deemed to be central if it is cited frequently by those journals that are, in turn, cited frequently by other journals. Moreover, these exchanges are typically unequal because citations between journals are not necessarily reciprocated. Consequently, central journals often receive more citations from peripheral journals than they give to them. This network of citations between journals can be represented by a citation matrix in which every cell contains the number of citations received by the journal associated with that row from the journal associated with that column. In short, the citation matrix is a proximity matrix in which the number of citations between two journals is a measure of their proximity to one another. This matrix will necessarily be square but it will usually be asymmetric.

It is well known in network analysis that the mathematical solution to measuring centrality within such a network is provided by the first eigenvector of the asymmetric matrix of proximities. However, given the unique characteristics of citation data, the citation matrix must first be adjusted in order to provide meaningful results. The first difficulty is that journals often

cite themselves. These self-citations will inflate the centrality of those journals that cite themselves extensively. For that reason, it is necessary to eliminate the effects of journal self-citations by setting the main diagonal elements of the citation matrix to zero. Another difficulty is that journals do not publish the same number of articles. Other things being equal, a journal that publishes more articles than other journals will be cited more often than those journals. Consequently, it is necessary to standardize the number of times a journal is cited by the number of articles it publishes. This can be achieved by dividing the number of times a journal is cited by every other journal by the number of articles it has published.

In order to conduct such an analysis of the centrality of the journals in sociology, it is necessary to compile data on the number of citations between all of the major journals in the discipline. Specifically, this analysis examines the citations between 64 major journals that are of primary interest to sociologists. Not surprisingly, the sample includes many of the journals that are cited the most by the three core journals in sociology. In particular, it includes both sociology journals and those interdisciplinary journals in which sociologists publish on a routine basis. Consequently, the sample includes such journals as *Administrative Science Quarterly* and *Public Opinion Quarterly*. However, it excludes journals that are associated primarily with other disciplines, even though they are cited frequently by the core journals in sociology. As a result, the sample does not include such journals as *American Political Science Review* or *Journal of Political Economy*. This analysis is based on citation data for these 64 major journals in sociology for a period of three years from 1999 to 2001.

The results of the network analysis of centrality among these 64 journals are presented in Table 1. The centrality of each journal is measured by its value on the first eigenvector of the adjusted citation matrix. Following the conventions of factor analysis, this eigenvector is normalized so that its inner product is equal to its eigenvalue. The results presented in Table 1 establish two important points. First, these results confirm that *American Sociological Review*, *American Journal of Sociology* and *Social Forces* are indeed the three most central journals in sociology. Second, it demonstrates that these centrality scores are highly correlated with their corresponding core influence scores. Specifically, the correlation between the centrality and core influence scores for those 58 journals included in both analyses is 0.959. This suggests that the

core influence scores are valid and that the centrality of a journal within the discipline can be inferred, at least approximately, from the number of times it is cited by the three “core” journals in the discipline.

There are, of course, some disparities between the results provided by these two measures. To begin with, it is clear that some of the major specialty journals have higher centrality scores than might be inferred from their core influence scores. For example, *Journal of Marriage and the Family* and *Criminology* are both more central to the network of sociology journals than indicated by the number of times they are cited by the three core journals of the discipline. This pattern is probably attributable to the fact that there are several other journals in these specialty areas that cite these journals extensively. At the same time, the major methodological journals, *Sociological Methodology* and *Sociological Research and Methods*, have lower centrality scores than might be inferred from their core influence scores. The pattern probably stems from the fact that articles published in the three core journals rely more often on advanced statistical and methodological techniques than articles published in other journals within the discipline.

From a purely methodological point of view, it is clear that the “centrality” of a journal is a more valid measure of the “quality” or “importance” of a journal within the discipline than its “core influence.” After all, the centrality of a journal within the network of citations between journals is based upon more complete information. This fact also implies that the centrality scores of the journals within the analysis depend, to a large extent, upon the composition of the network. The omission of a peripheral journal from the analysis is not likely to affect the results appreciably. However, the inadvertent omission of a central journal may bias the results of the analysis. Alternatively, the core influence of a journal is not affected by the addition or omission of journals from the analysis. Moreover, the core influence score of a journal is much more interpretable than its centrality score. Given the fact that the two approaches yield very similar results, the core influence of a journal provides a ready and highly interpretable measure of the quality and importance of a journal within the discipline.

Table 1: Centrality and Core Influence Scores for 64 Journals in Sociology, 1999-2001

<u>Journal</u>	<u>Centrality</u>	<u>Rank</u>	<u>Core Influence</u>	<u>Rank</u>
<i>Am Sociol Rev</i>	2.419	1	13.05	2
<i>Am Jour Sociol</i>	1.830	2	13.36	1
<i>Soc Forces</i>	0.851	3	3.87	5
<i>Jour Marriage & Fam</i>	0.565	4	1.18	13
<i>Admin Sci Quart</i>	0.557	5	4.23	4
<i>Annu Rev Sociol</i>	0.539	6	4.85	3
<i>Demography</i>	0.512	7	1.98	8
<i>Soc Problems</i>	0.275	8	1.25	11
<i>Criminology</i>	0.274	9	0.99	21
<i>Soc Psychol Quar</i>	0.246	10	1.99	7
<i>Sociol Methodol</i>	0.230	11	3.35	6
<i>Jour Health & Soc Behav</i>	0.220	12	1.16	14
<i>Popul & Dev Rev</i>	0.194	13	1.00	20
<i>Jour Fam Issues</i>	0.190	14	0.52	38
<i>Sociol Quart</i>	0.188	15	0.73	29
<i>Sociol Method & Res</i>	0.184	16	1.90	9
<i>Soc Sci Quar</i>	0.174	17	0.34	47
<i>Soc Sci Res</i>	0.162	18	1.13	16
<i>Sociol Educ</i>	0.158	19	1.89	10
<i>Soc Networks</i>	0.153	20	1.08	17
<i>Gender & Soc</i>	0.144	21	0.57	35
<i>Sociol Perspect</i>	0.141	22	0.77	26
<i>Theor & Soc</i>	0.127	23	0.85	23
<i>Sociol Forum</i>	0.123	24	0.60	34
<i>Jour Sci Stud Relig</i>	0.119	25	0.63	32
<i>Res Organ Behav</i>	0.116	26	1.21	12
<i>Pop Stud</i>	0.111	27	0.37	46
<i>Law & Soc Rev</i>	0.109	28	0.51	39
<i>Ration Soc</i>	0.107	29	0.81	24
<i>Jour Res Crime & Delinq</i>	0.102	30	0.55	37
<i>Work & Occupation</i>	0.098	31	1.14	15
<i>Int Migr Rev</i>	0.094	32	0.37	45
<i>Sociol Theor</i>	0.087	33	0.75	28
<i>Jour Math Sociol</i>	0.082	34	1.08	18
<i>Jour Hum Resour</i>	0.076	35	0.47	41
<i>Sociol Inq</i>	0.076	36	0.27	58
<i>Sociology</i>	0.072	37	0.28	57
<i>Ind & Labor Relat Rev</i>	0.071	38	0.24	62
<i>Polit & Soc</i>	0.071	39	0.61	33
<i>Rural Sociol</i>	0.070	40	0.14	83

<i>Hum Relat</i>	0.069	41	0.10	
<i>Public Opin Quart</i>	0.069	42	1.02	19
<i>Rev Relig Res</i>	0.063	43	0.63	31
<i>Symb Interact</i>	0.059	44	0.17	72
<i>Urban Aff Rev</i>	0.059	45	0.15	80
<i>Jour Quant Criminol</i>	0.058	46	0.23	63
<i>Jour Crim Law & Crim</i>	0.056	47	0.20	64
<i>Brit Jour Sociol</i>	0.054	48	0.31	50
<i>Organ Stud</i>	0.048	49	0.16	77
<i>Econ & Soc</i>	0.047	50	0.32	49
<i>Crime & Delinquency</i>	0.045	51	0.12	89
<i>Soc Stud Sci</i>	0.042	52	0.19	69
<i>Euro Sociol Rev</i>	0.040	53	0.30	52
<i>Ethnic & Racial Stud</i>	0.037	54	0.09	
<i>Sociol Relig</i>	0.035	55	0.30	53
<i>Popul Res & Policy Rev</i>	0.033	56	0.26	60
<i>Soc Sci Hist</i>	0.032	57	0.33	48
<i>Youth & Soc</i>	0.029	58	0.16	78
<i>Econ Dev & Cult Change</i>	0.025	59	0.20	65
<i>Acta Sociol</i>	0.018	60	0.17	76
<i>Can Rev Sociol & Anthr</i>	0.018	61		
<i>Work Employ & Soc</i>	0.017	62		
<i>Sociol Rev</i>	0.016	63		
<i>Deviant Behav</i>	0.015	64		