

that event, insist that more research be done to choose between the author's explanation and your own. If it would be extremely difficult to design research to test among the possibilities, that's the author's problem. After all, who chose this line of research?

6. The perspicacious reviewer leaves no theoretical statement unchallenged. Nearly always, theoretical statements are too broadly worded, and of course the results can never establish that the theoretical statement is generally true. Any theoretical statement left standing must be hedged with at least three qualifying phrases. In addition, any reviewer worth his or her salt can think up as good a theoretical position as the author's in a few minutes' time. The author may then be criticized for failing to take this position into account in the manuscript.

7. Final rule for editors: In the old days, articles were accepted or they were rejected outright with a brief explanation of the reason or reasons. The modern editor never makes such a simple-minded decision. Instead, all authors are sent a six- to eight-page letter supplementing and sometimes contradicting the reviewer's four- to six-page critical commentary. This letter begins with the following sentence: "The reviewer and I are in agreement that your manuscript is not acceptable in its present form." The author is then required to deal with the 10-14 pages of methodological, statistical, and conceptual criticism and to cut the length of the article by one third. Finally, the author is told that such a revision might be acceptable but that of course no commitments can be made in advance. This effectively discourages the authors of inferior manuscripts but leaves them feeling much better than if the manuscript had actually been rejected. The author of a superior manuscript will revise and resubmit, along with a 10- to 15-page letter attempting to justify his or her failure to comply completely

with the editor's instructions for revision. This initiates what is usually the first of several challenging exchanges between editor and author. Along the way, authors of less superior manuscripts tend progressively to drop out, leaving only the finest manuscripts for publication. These manuscripts, of course, have been greatly improved by dealing at length with all possible methodological and conceptual criticisms and by largely abandoning the theoretical considerations that gave rise to the study.

RICHARD E. NISBETT
University of Michigan

An Evaluation of 80 Psychology Journals Based on the Science Citation Index

Much recent effort has been devoted to determining a relative ranking of psychology journals in terms of excellence. Mace and Warner (1973) sampled opinions of departmental chairpersons to determine such ratings, while Koulack and Keselman (1975) obtained more extensive evaluations by sampling opinions of members of the American Psychological Association. These ratings have been criticized on various grounds (e.g., Boor, 1973; Buss & McDermott, 1976; Gynther, 1973; Hohn & Fine, 1973; Levin & Kratochwill, 1976; Porter, 1976). One major drawback to these analyses is that they simply survey subjective opinions that may be unrelated to more objective assessments of journal esteem and impact. There have been three recent attempts to obtain a more objective measurement of journal worth by using some form of citation analysis (Buss & McDermott, 1976; Porter, 1976; White & White, 1977).

The most comprehensive attempt to obtain an objective assessment of psychology journals was that of White and White (1977). Briefly, they sampled every 10th page of the 1974 *Social Science Citation Index* (SSCI) and counted the number of references to articles appearing in

57 psychology journals in 1972 and 1973. By multiplying the number of citations found with this sampling procedure by 10, they were able to estimate the total number of times that articles appearing in the 1972 and 1973 issues of the 57 journals were cited in 1974. In addition, by dividing this total by the number of articles appearing in the journals in those years they were able to calculate the average number of citations to an article in each of the journals. This number, the average number of citations per article, is referred to as the *impact factor* (Garfield, 1972). White and White (1977) ranked the 57 psychology journals by this impact factor.

There are several difficulties with the White and White (1977) attempt at assessment of psychology journals. First, since they sampled only every 10th page, there is the problem of the reliability of the figures they obtained. They correlated the rankings obtained from the first half of the sample with those from the second half, and their Pearson r of .72 does not inspire confidence that this sampling procedure produced reliable results. If the sampling procedure is not reliable, then obviously the derived estimates of total citations, the impact factors, and the ratings are also open to serious question. Obviously what is needed is an evaluation of psychology journals based on a much more exhaustive sample of citations.

Another difficulty of the White and White (1977) study is that a number of important psychology journals were not included in their sample. Some notable omissions from their study were *Cognitive Psychology*; *Psychophysiology*; *Learning & Motivation*; *Perception & Psychophysics*; *Memory & Cognition*; and *Physiological Psychology*.

The present report is another attempt to evaluate the relative impact of psychology journals using citation analysis, but correcting to a large extent the shortcomings of

TABLE 1: Rank Order, in Terms of Impact on Science, of 80 Psychology Journals
(Data from the 1975 Science Citation Index Journal Citation Reports)

Journal name	Rank among the 80 journals	Impact factor (Mean citations per article)	Total citations in 1974 to all years	Relative ranking of 2,630 journals
Psychological Review	1	4.156	2921	88
*Cognitive Psychology	2	3.016	388	152
Psychological Bulletin	3	2.349	2782	236
Journal of Verbal Learning and Verbal Behavior	4	2.297	1795	243
Annual Review of Psychology	5	2.086	247	283
*Vision Research	6	1.800	2147	345
*Psychophysiology	7	1.608	959	409
Journal of the Experimental Analysis of Behavior	8	1.555	2132	431
Journal of Experimental Child Psychology	9	1.429	754	483
Child Development	10	1.279	1525	573
American Journal of Psychiatry	11	1.264	3027	577
Journal of Comparative and Physiological Psychology	12	1.230	4085	597
Developmental Psychology	13	1.227	837	599
*Journal of the Acoustical Society of America	14	1.142	5428	649
*Learning & Motivation	15	1.125	185	654
*Merrill-Palmer Quarterly	16	1.122	152	656
*Perception & Psychophysics	16	1.122	1693	656
*Animal Behaviour	18	1.111	1349	666
*Memory & Cognition	19	1.089	127	680
*Behaviour	20	1.079	829	684
American Psychologist	21	1.060	1055	699
Journal of Experimental Psychology	22	1.027	5388	729
Journal of Experimental Social Psychology	23	1.024	432	732
Behaviour Research & Therapy	24	1.015	691	745
Journal of Abnormal Psychology	25	1.015	907	745
Journal of Personality and Social Psychology	26	.955	2567	792
Quarterly Journal of Experimental Psychology	27	.939	715	803
*Journal of Child Psychology & Psychiatry & Allied Disciplines	28	.848	223	884
Journal of Personality	29	.841	610	892
Journal of Mathematical Psychology	30	.804	254	920
Psychometrika	31	.803	845	921
Journal of Consulting and Clinical Psychology	32	.716	897	1016
British Journal of Psychology	33	.710	729	1022
*Behavior Therapy	34	.686	225	1054
Journal of Educational Psychology	35	.656	676	1098
*Animal Learning & Behavior	36	.640	107	1102
Canadian Journal of Psychology	37	.636	608	1104
*Human Development	38	.623	116	1122
*Developmental Psychobiology	39	.622	157	1124
*Physiological Psychology	39	.622	138	1124
Bulletin of the Psychonomic Society	41	.607	2985	1142
Journal of Applied Behavior Analysis	42	.591	239	1166
Psychological Record	43	.589	302	1170
British Journal of Social and Clinical Psychology	44	.587	259	1172
Journal of Applied Psychology	45	.510	785	1283
British Journal of Mathematical & Statistical Psychology	46	.455	125	1395
Journal of Social Issues	47	.452	217	1404
*Psychology Today	48	.445	164	1422
*Scandinavian Journal of Psychology	49	.441	240	1435
American Journal of Psychology	50	.437	1049	1441
British Journal of Medical Psychology	51	.425	265	1457
Acta Psychologica	52	.405	426	1494
*Behavior Research Methods & Instrumentation	53	.385	339	1532
Journal of Clinical Psychology	54	.366	665	1573
*Canadian Journal of Behavioural Science	55	.351	58	1610
*Genetic Psychology Monographs	56	.343	178	1624

(table continued)

TABLE 1 (continued)

Journal name	Rank among the 80 journals	Impact factor (Mean citations per article)	Total citations in 1974 to all years	Relative ranking of 2,630 journals
Journal of Genetic Psychology	57	.338	558	1634
Personnel Psychology	58	.330	223	1659
British Journal of Educational Psychology	59	.324	173	1666
Journal of Counseling Psychology	59	.324	416	1666
Journal of General Psychology	61	.307	380	1708
Behavioral Science	62	.289	341	1754
Perceptual and Motor Skills	63	.270	1406	1796
*Canadian Psychologist	64	.269	48	1798
Psychological Reports	65	.266	1575	1803
Journal of Social Psychology	66	.253	443	1826
*Human Factors	67	.248	193	1841
Ergonomics	68	.242	244	1854
American Journal of Orthopsychiatry	69	.210	605	1932
Australian Journal of Psychology	70	.186	91	1990
*Japanese Psychological Research	71	.184	29	1997
Journal of Psychology	72	.160	624	2050
Human Relations	73	.143	137	2084
*Psychological Issues	73	.143	40	2084
*Journal of Analytical Psychology	75	.129	20	2108
Journal of Marriage & the Family	76	.076	108	2235
*Journal of Individual Psychology	77	.049	53	2283
Educational & Psychological Measurement	78	.048	153	2286
*Annual of Animal Psychology	79	.000	1	2434
Monographs of the Society for Research in Child Development	79	.000	26	2434

Note. Asterisks indicate journals omitted from White and White's (1977) evaluation.

* Includes 1972 articles in *Psychonomic Science*.

the White and White (1977) procedure. Briefly, we have ranked 80 psychology journals and journals from closely related fields (e.g., *Vision Research*) in terms of their impact factors (average citations per article) where the numerator for the impact factor is based on the total number of citations accruing to 1972-1973 articles in that journal in the 1974 *Science Citation Index* (SCI). This ranking was made possible by the publication in 1975 of a new volume called *Journal Citation Reports* for the *Science Citation Index*. This newly added volume to the SCI lists a variety of information on some 2,630 science journals, including the total citations accruing to each journal and the impact factors based on these totals.

Presented in Table 1 is a listing of the 80 psychology journals ranked according to their impact factors. In the first column for each journal is its rank, in the second column is its impact factor, in the third column are the total citations in 1974

to all articles ever appearing in the journal, and in the fourth column is the relative ranking of the journal among 2,630 science journals in 1974. The impact factor is the average number of citations received in 1974 for the articles appearing in 1972 and 1973. Thus, for example, *Psychological Review*, which published 77 articles in 1972 and 1973 and received 320 citations to these articles in 1974 had an impact factor of 4.156, the highest among psychology journals. *Psychological Reports*, which received 245 citations to its 1972-1973 articles during 1974, had an impact factor of only .266 because it contained 921 articles during 1972 and 1973. An asterisk appears beside the journals in Table 1 that were omitted from White and White's (1977) evaluation. Unfortunately, there were six journals included in the White and White (1977) study that are not indexed by the SCI (*Child Study Journal*; *Journal of Educational Measurement*; *Journal*

of Educational Research; *Journal of Organizational Behavior and Human Performance*; *Journal of Research in Personality*; and *Professional Psychology*). The last of these was estimated to have zero citations in the White and White study.

The overall correlation between the rankings of White and White and those in our Table 1 for the 51 journals common to the two reports is .52 (Kendall's tau). There are some rather remarkable discrepancies between the two evaluations for some journals. For example, the *Annual Review of Psychology* was ranked 47.5 of 57 in their evaluation, but 5 of 80 in ours. In our study *American Psychologist* ranked 21, but in theirs it was ranked second. There are numerous other fairly substantial discrepancies. It might be argued that these differences reflect the fact that the White and White (1977) study was based on the *Social Science Citation Index* while our study was based on the *Science Citation Index*. It is

possible that this fact accounts for some of the difference, but we think that it is more likely that the major differences are due to the unreliability of the procedure used by White and White. Since both studies examined citations in 1974 to articles in 1972 and 1973, we were able to compare their estimates of total citations with the total population in the SCI.

This analysis revealed that the White and White estimates were, on average, greater than the actual counts in the SCI. For the 51 journals common to both studies, the mean estimated number of citations by White and White was 188.0, while the mean number of citations counted in the SCI was 158.6. As this implies, there were rather great discrepancies in terms of the number of citations estimated by White and White and those actually counted in the SCI. For 22 of the 51 journals there was a discrepancy of 50 or more citations, and in seven cases the discrepancy was greater than 200. The mean absolute deviation between the White and White estimates and the SCI counts was 73.5. These large discrepancies are not due to the SCI indexing a markedly different set of journals than the SSCI, because with regard to psychology the two indexes overlap almost completely, with both covering the major psychology journals. (Only six journals were included in the White and White study of SSCI that were not included in the SCI).

Use of the SCI rather than the SSCI probably underestimates citations for some social science journals. However, the fact that the mean of journal citations from the SCI is smaller than that estimated by White and White from the SSCI appears to be due as much to the unreliability of the SSCI estimates as to any bias in the SCI. This is shown, for example, by the fact that the *Journal of Personality and Social Psychology*, a social science journal, actually received 65 more citations in the SCI than were estimated from the SSCI. On the other

hand, the *Journal of Comparative and Physiological Psychology*, which might be expected to receive more citations in the SCI than SSCI, actually was estimated by White and White to have about 350 more citations than were actually counted in the SCI. Thus, we feel (a) that the discrepancies between our study and that of White and White (1977) in evaluation of psychology journals are largely due to the unreliability of their methods, and (b) that the ranking according to impact factors from the SCI presented here is superior.

The ranking of psychology journals by citations is somewhat correlated with the rankings obtained when departmental chairpersons or randomly selected APA members evaluate the journals. The correlation (Kendall's tau) between journals common to the present study and the study obtaining rankings from departmental chairpersons (Mace & Warner, 1973) was .45, while that between the present study and the study of randomly sampled APA members (Koulack & Keselman, 1975) was only .20. Thus, the more objective rankings obtained from the SCI are to some extent independent of the subjective ratings of individuals, who may be quite unfamiliar with a large number of the journals evaluated (Boor, 1973).

Citations have recently been used in several analyses in psychology. For example, Myers (1970) listed the 62 most frequently cited individuals in psychology, and Endler (1977) and Rushton and Endler (1977) evaluated psychology departments in Canada and the United Kingdom, respectively, by the number of citations accruing to faculty in the departments. The evaluation by means of citation analysis of psychology journals can now be easily accomplished with the publication of the *Journal Citation Reports* of the SCI, and it would probably be worthwhile to evaluate psychology journals in this manner every few years. Changes in journal impact with changes in editorial

policies of journals could be accurately gauged with citation analysis. Such evaluations would also aid authors in deciding which journals are preferable in their particular field.

REFERENCES

- Boor, M. Unfamiliarity breeds disdain: Comment on department chairmen's ratings of psychological journals. *American Psychologist*, 1973, 28, 1012-1013.
- Buss, A. R., & McDermott, J. R. Ratings of psychology journals compared to objective measures of journal impact. *American Psychologist*, 1976, 31, 675-678.
- Endler, N. S. Research productivity and scholarly impact of Canadian psychology departments. *Canadian Psychological Review*, 1977, 18, 152-168.
- Garfield, E. Citation analysis as a tool in journal evaluation. *Science*, 1972, 178, 471-479.
- Gynther, M. D. On Mace and Warner's journal ratings. *American Psychologist*, 1973, 28, 1013.
- Hohn, R. L., & Fine, M. J. Ratings and misratings: A reply to Mace & Warner. *American Psychologist*, 1973, 28, 1012.
- Koulack, D., & Keselman, H. J. Ratings of psychology journals by members of the American Psychological Association. *American Psychologist*, 1975, 30, 1049-1053.
- Levin, J. R., & Kratochwill, T. R. The name of the journal fame game: Quality or familiarity? *American Psychologist*, 1976, 31, 673-674.
- Mace, K. C., & Warner, H. D. Ratings of psychology journals. *American Psychologist*, 1973, 28, 184-186.
- Myers, C. R. Journal citations and scientific eminence in contemporary psychology. *American Psychologist*, 1970, 25, 1041-1048.
- Porter, A. L. Use lists with caution. *American Psychologist*, 1976, 31, 674-675.
- Rushton, J. P., & Endler, N. S. The scholarly impact and research productivity of departments of psychology in the United Kingdom. *Bulletin of the British Psychological Society*, 1977, 30, 369-373.
- White, M. J., & White, K. G. Citation analysis of psychology journals. *American Psychologist*, 1977, 32, 301-305.

J. PHILIPPE RUSHTON
University of Western Ontario

HENRY L. ROEDIGER III
University of Toronto