Productivity and Scholarly Impact (Citations) of British, Canadian, and U.S. Departments of Psychology (1975)

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ABSTRACT: *The psychology departments at 180 universities in Canada, the United Kingdom, and the United States were evaluated in terms of their productivity and the impact of their scholarly research. The 1975* Social Science Citation Index (*SSCI*) *was used as the basis for counting both citations of, and publications by, each of the 5,597 faculty members. Psychologists at the 180 evaluated departments received a total of 76,189 citations in 1975 ($M = 13.6$) and produced a total of 4,977 publications ($M = .89$). Data are presented for the top 100 departments. These include the total, mean, and median number of citations of each department as well as the total and mean number of publications. The citation measures correlated more highly with reputational ranks taken on 76 American schools in an earlier study than did the publication measures. The departments of psychology at four universities were consistently in the top eight on the total, mean, and median citation measures of scholarly impact: Stanford University, Harvard University, Yale University, and the University of Pennsylvania. Eighteen of the top 100 departments in terms of total citations were from either Canada or the United Kingdom. Methodological difficulties in using the SSCI and possible uses and limitations of citation counts are discussed.*

Psychology departments can be evaluated on a number of dimensions: scientific contributions (research productivity and impact), teaching excellence, applied contributions, and contributions to the community. In the present article we are concerned with providing objective measures of the relative scientific contributions of 180 graduate psychology departments in Canada, the United Kingdom, and the United States.

Several attempts have been made in the past to compare psychology departments in the United States using ratings. In one study (Keniston, 1959), chairpersons in 25 leading universities rank ordered the 15 "strongest" departments in their fields. For psychology, the first few, in order, were Harvard University, the University of Michigan, Yale University, the University of California, Berkeley, Stanford University, the University of Minnesota, and the University of Illinois. In 1966, the American Council on Education conducted an extensive survey, gathering data from 4,000 faculty members in 30 disciplines at 106 major institutions (Cartter, 1966). The top departments of psychology from this study were Stanford University and Harvard University (tied for first place); Yale University, the University of Michigan, and the University of California, Berkeley (tied for third place); then the University of Illinois, the University of Wisconsin, and the University of Minnesota. Overall, the results were similar to those of the previous study. In 1970, the American Council on Education updated their 1966 study, rank ordering the top 32 institutions for psychology and providing data on another 44 (Roose & Andersen, 1970). The

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top few in this listing were, in order, Stanford University, the University of Michigan, the University of California, Berkeley, Harvard University, the University of Illinois, the University of Pennsylvania, the University of Minnesota, the University of Wisconsin, and Yale University. Once again, we note that the same names keep cropping up, at least at the top of the list.

The use of ratings in evaluations does have some value but also may present certain problems. One drawback to these analyses is that they simply survey subjective opinions. Raters may be more familiar with some programs than others, and this may result in one source of bias. Another may arise from halo effects, where the evaluation of a particular department may be influenced by the prestige of the school. For example, we discovered in the course of the present study that the psychology department at one school (California Institute of Technology) that was ranked in the top 48 by Roose and Andersen (1970) actually employed only one full-time psychologist in 1977 (Breger, Note 1). Several other psychologists are employed in other departments but apparently are not even cross-appointed with the psychology department. Presumably, the psychology department there received its high rating because the school is excellent in other areas and possibly because the raters assumed that well-known psychologists located there were associated with the psychology department. Insufficient knowledge of numerous programs and various other sources of bias may limit the usefulness of ratings as a reflection of scholarly impact.

One recent study (Cox & Catt, 1977) attempted to avoid the problem of rating procedures by using the more objective method of assessing the productivity of United States psychology departments. This was accomplished by counting the number of journal articles appearing in 13 journals of the American Psychological Association that could be attributed to psychology departments. The top five schools based on total publications over a 6-year period (1970–1975) were the University of Wisconsin, the University of Illinois, Yale University, the University of Michigan, and Ohio State University. Cox and Catt (1977) found that their productivity index based on total publications correlated only .35 ($n = 85$, $p < .001$) with the Roose and Andersen (1970) rank orderings based on ratings. In addition, Cox and Catt's total-publications measure correlated .38 with another rank ordering they produced taking faculty size into account. This mean-publication-per-faculty measure correlated, in turn, .21 ($p < .005$) with the Roose and Andersen (1970) listing. Thus, while these three rank orderings had some degree of commonality, they were to a rather great extent independent. This lack of commonality may in part be due to the several limitations of the Cox and Catt (1977) study. A first problem deals with the representativeness of the journals that were sampled. As Cox and Catt point out, there are many other important psychological journals than those published by the APA. More importantly, simply measuring the sheer number of publications attributable to particular departments says nothing about their quality or impact. Some publications obviously have much more impact than others, and many books and book chapters that have great impact were obviously not included. In addition, Cox and Catt (1977) made no attempt to rank psychology departments outside of those in the United States.

The present study was primarily devoted to measuring the impact of psychology departments based on the number of citations accruing to the individuals in those departments in the 1975 *Social Science Citation Index* (SSCI). The SSCI was also used to gain an estimate of the productivity of psychology departments. Previous studies have measured the impact and productivity of Canadian psychology departments (Buss, 1976; Endler, 1977) and those of the United Kingdom (Rushton & Endler, 1977). In the present study we evaluated a large number of U.S. departments, and we present data on the top 100 departments in Canada, the United Kingdom, and the United States in terms of both their impact and productivity as derived from the 1975 SSCI.

The *Science Citation Index* (SCI) and the more recently established *Social Science Citation Index* (SSCI) serve as a valuable data base for the relatively objective assessment of the productivity and scholarly impact of psychology departments and psychologists. The SCI indexes articles from "hard science" journals and selectively indexes articles from social science journals. At least 90 psychology journals are fully indexed (see Rushton & Roediger, 1978, for a partial listing). The SSCI completely indexes articles from over 1,400 journals representing virtually every discipline in the social sciences and selectively covers another 1,200 journals representing the natural and physical sciences. At least 180 psychology journals are indexed. Therefore, the SSCI is more compre-

hensive than the SCI for psychology. Both citation indexes are organized such that one can look up a particular person for a particular year and count the number of times that the person was cited in that year in articles in the journals covered by the index. Thus, citations that appear in books, book chapters, etc., are not counted. However, citations in journal articles of books, chapters, and convention papers do appear in the citation indexes. Thus it is possible to measure the impact of a person's (or department's) scholarly activity by counting the number of times that the person's work is cited.

Data on the reliability and validity of citation counts as a measure of impact for psychology have been provided by Myers (1970). In regard to validity, for example, the total number of citations an individual earns has been found to predict such different measures of scientific eminence as Distinguished Scientific Contribution Awards and presidency of the American Psychological Association, as well as peer ratings of eminence. For other fields, too, citations are highly predictive. Thus Cole and Cole (1971) noted that the average number of citations in the 1961 SCI for Nobel prizewinners in physics between 1955 and 1965 was 58 and that only 1% of cited scientists received 58 or more citations in 1961. Wade (1975) reported that of the 50 most cited authors in the 1973 SCI, 12 had won Nobel prizes. Garfield (1977a, 1977b, 1977c) listed the 250 most cited individuals in all disciplines for the period 1961–1975. These individuals had a yearly SCI citation average over this period of 266, compared to the yearly average of all authors cited in the SCI of 7. Seventeen percent of them (42) had received the Nobel prize. Forty-four percent (110) had been elected to the U.S. National Academy of Science and 22% (55) belonged to the Royal Society of London. In all, over 60% (151) had been members of at least one national academy. Thus, high citations for individuals are validated against clear recognition of scientific eminence.

Citations have recently been used in a variety of studies in psychology. Myers (1970) listed the 62 most frequently cited individuals in psychology. Garfield (1976) used citations to identify some 100 research fronts or areas and the linkages between them and then to display the results in "cluster maps." White and White (1977), Rushton (1977), and Rushton and Roediger (1978) have reported the impact of the various psychology journals on the field.

There are a number of difficulties with the use of citations as a measure of scholarly impact (see Buss, 1976; Cole & Cole, 1971; Endler, 1977, 1978). One is that work is cited for a variety of reasons; it may be cited because it was poorly done or cannot be replicated, as well as being cited in a positive sense. When measuring the impact of entire departments or highly cited individuals, it is unlikely that this kind of "negative citation" has much influence.

Another difficulty is that the SSCI and the SCI only include citations of the first author of an article and thus may underestimate the impact of the other authors. Cole and Cole (1971) reported a study of 120 physicists that contained the full range of citation data for the whole sample, including citations in which the author was first, second, or third. They reported a correlation of ".96 between a straight citation count and total citations (including citations to collaborative work on which the physicist was not first-named author)" (p. 28). For the 120 physicists, the rank-order correlation between straight citation counts and total citations was .85. Assuming that these results can be generalized to psychologists, it appears that citing only first authors does not seriously bias the results.

A third objection to citation counts in the SSCI is that self-citations are included. However, Endler (1977) found a correlation of .994 between total citations and citations excluding self-citations for the 35 psychology departments in Canada. Thus we decided to use total citations, including self-citations, in the present study.

Using the SSCI does bias the results against physiological psychologists somewhat, so the impact and productivity of departments that are strong in biological psychology may be underestimated in our study. The SSCI does selectively abstract such journals as the *Journal of Comparative and Physiological Psychology, Brain,* and the *Journal of Comparative Neurology,* but it is still the case that the SSCI generally provides lower citation rates than the SCI for physiological psychologists. For example, the three editors of the 1977 *Journal of Comparative and Physiological Psychology* had some 40 citations among them in the 1975 SSCI. This would have more than doubled had we used the 1975 SCI.

There are other difficulties in using citations as a measure of impact that we discuss later (see also Buss, 1976; Endler, 1977, 1978). However, except for the bias against biological psychology, we

think that none of the others discussed so far is serious for the evaluation of entire departments or individuals with large numbers of citations. Of course, these other difficulties (inclusion of self-citations, citations accruing only to the first author on a report, and citations for poor work) may be much more important for other purposes. For example, if citation counts were to be used for the evaluation of the impact of individuals (e.g., for promotion), consideration of these other difficulties would be critical.

The SSCI, besides providing information on citations of individuals, also lists all articles published in a given year by individuals. These include all articles on which an individual was an author, whether listed first, second, third, etc. Thus, the Source Index of the SSCI can be used to gain a measure of the productivity of psychology departments, although certain sources such as books, book chapters, etc., are excluded.

In the present study we attempted to measure the impact and productivity of some 180 graduate psychology departments in Canada, the United Kingdom, and the United States by using the 1975 SSCI. Faculty lists were obtained from official university catalogs in all but a few cases. The number of citations and publications for some 5,600 psychologists were counted, and the totals, means, and medians for the departments were calculated. Presented here are the data on the top 100 schools and the top 100 individuals.

Method

The latest university catalogs available (usually 1976–1977 and 1977–1978) were used to list the faculty of each of some 180 departments of psychology within the United States, Canada, and the United Kingdom. The universities in the United States included in this initial sampling were the 76 listed in the Roose and Andersen (1970) study, all those that made the "most productive" tables in the Cox and Catt (1977) study, and a few others that occurred to the authors as possible contenders (e.g., Rockefeller University). The British universities were the 45 studied by Rushton and Endler (1977), and the Canadian ones were the 35 studied by Endler (1977).

From the catalogs we listed the psychology faculty. We *excluded* professors emeriti, visiting faculty, independent research workers, research assistants and associates, and lecturers. Cross-appointments, however, if listed with full-time full, associate, and assistant professors, were included. From these catalogs we derived a list of 5,597 individual psychologists.

Universities differ considerably both in how up-to-date they keep their catalogs and in whom they list as their full-time faculty. Thus the movement of a faculty member from one university to another may not be recorded in either catalog for quite a period of time. It might even result in the person being listed as a full-time member of two universities simultaneously. Another problem with university catalogs is that while some universities list cross-appointments and members of branch campuses as full-time faculty, others do not. Our convention was to list all those *defined by the University* as full-time members of the faculty. This "objective" method of defining the sample size and its membership is undoubtedly a source of some error. For example, it has led to the exclusion of Donald Broadbent at Oxford University because the university does not define him as a full-time faculty member there. (He holds a research position.) Although problematic in many ways, this seemed to us a better procedure than relying on the "subjective" listings of chairpersons or others. It should be kept in mind, however, that the faculty list was for only 1 year and that changes may subsequently have occurred. Our estimates of faculty size do not agree very well in some cases with those listed in the American Psychological Association's (1974) *Graduate Study in Psychology, 1975–1976.* This may be due in part to the fact that we have included cross-appointments. Thus it should be kept in mind when considering our results that we have defined faculty size in this particular way.

For some universities we were unable to obtain catalogs listing psychology faculty members, usually because the catalog did not contain such a list. In these cases we were forced to rely either on a departmental brochure listing the faculty or a list provided by the department. For several universities we were unable to obtain either a catalog or a usable faculty list after repeated requests.

The number of publications produced by each of the psychologists in the year 1975 was ascertained, as was the total number of citations that others made of these psychologists' past work. The data source for both publications and citations was the 1975 SSCI. The 1975 SSCI Source Index lists all the *journal articles* published by a particular person during 1975 whether that person was a senior or a junior author. It *excludes* books,

chapters in books, articles reprinted in books, magazine articles, pamphlets, newsletters, unpublished reports, encyclopedia articles, and papers presented at symposia and conventions. Since the Source Index lists all authors, multiauthored publications are listed more than once. For example, if three faculty members in one department coauthor one paper, this would count as three publications for that department. To the extent that multiauthored papers occur more frequently in some departments, the productivity of these departments will be overestimated.

Citations were also counted from the 1975 SSCI, which lists *only* the senior author. The 1975 SSCI lists any citation of the work of an individual that appears among the references of the journal articles just described above in the SSCI Source Index. Such citations are of books, chapters in books, convention papers, and personal communications, as well as journal articles. Such citations only include the first-named author of multiauthored publications and exclude the other authors. The 1975 SSCI includes the references to all the articles published both prior to and during 1975. Therefore, the citation index reflects both scholarly maturity and current activity. The citation index includes self-citations, and these were counted.

The number of citations and published journal articles for 1975 were obtained for the 5,597 psychologists in our original sampling. These data were used to compute total, mean, and median citations and publications for each department. In this way, the top 100 psychology departments from the United States, the United Kingdom, and Canada could be rank ordered in terms of impact and productivity.

In any undertaking such as this, errors are bound to occur. The listings in the SSCI are subject to several sources of error in counting (Buss, 1976, p. 149). One common problem is the misspelling of an author's name when cited in a publication, or the omission of an initial. We attempted to check obvious sources of error such as this as much as possible. For example, B. J. Winer had citations listed under B. Winer, B. J. Weiner, B. Weiner, and other combinations. Other problems were caused by common surnames (Smith, Jones, etc.) when individuals could not be easily distinguished on the basis of initials and even by uncommon names when they belonged to more than one psychologist (e.g., M. Zuckerman, A. Rapoport). Another difficulty is presented by people with hyphenated names or people who change their surnames. These factors and others, such as the sheer tedium associated with counting up citations and publications for over 5,500 psychologists, have inevitably introduced some error into the results. For a large number of schools, the citation and publication figures were checked by a second person, with discrepancies being resolved by a third check by one of the authors. Thus, while we do not pretend that the results reported here are not subject to some measurement error, we feel that the amount of error is small relative to the size of the undertaking and does not seriously affect the rankings of departments.

Results

The 5,597 psychologists at the 180 institutions that were evaluated received a total of 76,189 citations in the 1975 *Social Science Citation Index* and produced a total of 4,977 journal articles. The mean number of citations was 13.6, and the mean number of publications was .9. Because of the markedly skewed nature of the distributions, these means are not entirely representative of the central tendency, especially in the case of citations. Perhaps a more representative measure of the central tendency is the mean of the medians for the 180 schools, which was 4.4 for citations and .2 for publications. The mode for both citations and publications was clearly zero.

Presented in Table 1 is a rank ordering of the top 100 schools in our sample based on the total number of 1975 SSCI citations accruing to all faculty members in the departments of psychology. Also reported in Table 1 for each department is the faculty size as determined from catalogs, the mean number of citations, the rank of the school based on the mean, the median number of citations, the rank based on the median, the rank of the school in the Roose and Andersen (1970) ratings when available, and the number of faculty members who received more than 25 and more than 100 citations. The number of persons receiving more than 25 citations includes those receiving more than 100. The top 10 departments as ranked by the total number of citations in 1975 are Stanford University, the University of Michigan, Harvard University, the University of Illinois, Yale University, the University of Pennsylvania, Purdue University, the University of Chicago, the University of Toronto, and the University of California, Los Angeles.

The total number of citations provides a global measure of the impact of a department, but it is one heavily influenced by the number of faculty in the department and by only one (or several) highly cited individuals. The measure of mean citations corrects for the number of faculty but still reflects the influence of a few highly cited members. The top 10 in terms of mean citations are Stanford University, Harvard University, the New School for Social Research, the University of Pennsylvania, Columbia University, Yale University, Northwestern University, the University of California, San Diego, and the University of California, Berkeley. Perhaps the best indicator of the average department's impact, not biased directly by faculty size or the effect of a few individuals, is the median number of citations a department receives. The top 10 in terms of median citations are Stanford University, Oxford University, the University of Chicago, Yale University, the University of Pennsylvania, Harvard University, the University of California, San Diego, the University of California, Santa Cruz, the Massachusetts Institute of Technology, and the University of Oregon.

Presented in Table 2 are the top 100 psychologists in terms of 1975 citations in the SSCI. We have included people from the 180 schools that were evaluated as well as others that occurred to us, such as Freud and Piaget. Also included in Table 2 are professors emeriti, even though their citations were not counted at their respective institutions in ranking departments (e.g., Cattell, Guilford, Hebb, etc.). It is possibly the case that other psychologists at departments not included in our study belong in the top 100. It should also be borne in mind that the numbers in Table 2 are based on only a single year and that both the individuals included and the rank ordering might change considerably if citations of another year were examined. However, Endler (in press) has shown in a study of the most frequently cited Canadian psychologists that citations of individuals are fairly stable in consecutive years. Despite these limitations, the data in Table 2 provide some estimate of the individuals with the greatest impact on contemporary psychology.

Table 3 presents a rank ordering of the top 100 schools, from our sample of 180, based on the total number of 1975 SSCI-listed publications that each department faculty member produced. Also reported in Table 3 for each department are the faculty size, the mean number of publications, and the rank of the school based on the mean. The number of publications listed here consists, once again, of those listed in the 1975 SSCI. There is not, therefore, a one-to-one relationship with a faculty member's curriculum vitae, as books and chapters in books are not included in the SSCI. A compensatory "error" in the SSCI, however, is that multiple authorships from the same department count as more than one article for that department, since the same article is counted for each faculty member contributing to it.

Table 4 presents the Pearson product-moment correlations between all measures across the 180 different departments: faculty size, total citations, mean citations, median citations, total publications, and mean publications. In addition, Table 4 also presents the correlations, where possible, with the data from the Roose and Andersen (1970) study of chairpersons' ratings of the quality of the graduate schools and with the measures of total and mean publications in the recent study by Cox and Catt (1977). As can be seen from Table 4, almost all the correlations are highly significant and positively related to one another.

In order to put productivity and impact for *individuals* into perspective, we offer the data in Table 5 for consideration. These cumulative percentage frequencies are based on the 4,070 faculty members at the top 100 departments of psychology based on total citations (i.e., Table 1). From Table 5 it can readily be seen that 52% of the faculty did not produce a paper in 1975 (as indexed by the 1975 SSCI). At the other extreme, one individual, H. J. Eysenck, published a total of 22 papers by our criterion. Although many of these papers constituted either book reviews or short comments on other people's papers, it is, by any standards, a remarkable degree of productivity. The picture is the same for citations. The great majority of academic psychologists have very few citations. Seventy-five percent of psychologists have 15 or fewer. A very small proportion of individuals have a disproportionately large impact on the field.

Discussion

The purpose of this study was to obtain information concerning the impact and productivity of most of the major departments of psychology in Canada, the United Kingdom, and the United States for the year 1975. We have provided

(text continued on page 1075)

TABLE 1

Ranking of the Top 100 British, Canadian, and U.S. Graduate Departments of Psychology by the Total Number of Citations Received by Faculty in the 1975 Social Science Citation Index

Rank	University	Total citations	Number of faculty	Mean citations	Rank based on mean	Median citations	Rank based on median	Roose & Andersen (1970) rating	Number of faculty with citations	
									>25	>100
1	Stanford University	3,574	45	79.4	1	36.0	1	1	26	12
2	University of Michigan	3,288	135	24.4	21	8.3	27.5	2	40	6
3	Harvard University[a]	2,740	41	66.8	2	16.0	6	4	16	11
4	University of Illinois	2,364	85	27.8	16	11.3	17	5	25	6
5	Yale University	2,189	60	36.5	7.5	18.5	4	7	24	9
6	University of Pennsylvania	2,033	45	45.2	5	16.4	5	6	15	6
7	Purdue University	1,824	69	26.4	20	6.0	44.5	40.5	10	3
8	University of Chicago[b]	1,701	54	31.5	11	21.0	3	16	21	1
9	University of Toronto (Canada)	1,598	52	30.7	12	7.5	33	—	10	5
10	University of California, Los Angeles	1,581	75	21.1	28	8.6	26	10	15	4
11	University of London[c] (United Kingdom)	1,570	124	12.7	55.5	1.7	>100	—	12	2
12	University of California, Berkeley	1,244	35	35.5	10	14.3	11	3	14	4
13	Rutgers—The State University	1,209	77	15.7	41	5.8	46.5	40.5	17	2
14	City University of New York	1,206	124	9.7	73	4.0	64.5	—	11	1
15	University of Washington	1,198	50	24.0	23	6.0	44.5	27	11	3
16	University of Connecticut	1,119	38	29.5	13	9.0	24	40.5	11	3
17	Northwestern University	1,094	30	36.5	7.5	7.5	33	16	6	1
18	State University of New York at Stony Brook	1,092	50	21.8	27	10.5	21	—	12	1
19	University of North Carolina	1,079	78	13.8	50.5	3.0	84.5	24	14	2
20	University of Wisconsin	1,060	37	28.7	14	10.0	22	7	13	1
21	Rockefeller University	1,026	51	20.1	32	1.6	>100	—	4	3
22	University of Colorado	1,025	49	20.9	29	10.8	20	14	15	1
23	Columbia University	976	22	44.4	6	13.0	13	27	7	4
24	University of Rochester	936	82	11.4	62.5	2.4	>100	20	11	2
25	University of Oregon	925	33	28.0	15	14.7	10	24	11	2

See footnotes at end of table, p. 1073.

TABLE 1—(*Continued*)

Rank	University	Total citations	Number of faculty	Mean citations	Rank based on mean	Median citations	Rank based on median	Roose & Andersen (1970) rating	Number of faculty with citations	
									>25	>100
26	Oxford University (United Kingdom)	886	16	55.4	3	25.0	2	—	8	2
27	Cornell University	885	49	18.0	37	5.1	50	20	7	3
28	McGill University (Canada)	849	37	22.9	26	6.8	40	—	9	2
29	University of Western Ontario (Canada)	841	43	19.6	33	3.3	76.5	—	5	2
30	University of Texas	817	42	19.5	34	7.5	33	11	8	1
31	New York University	793	42	18.9	35.5	5.0	52	30	8	2
32	University of California, San Deigo	761	21	36.2	9	15.0	8	—	8	2
33	University of Waterloo (Canada)	707	44	16.1	40	3.1	81	—	6	2
34	Duke University	669	29	23.1	25	8.3	27.5	24	3	2
35	Pennsylvania State University	660	39	16.9	39	5.8	46.5	16	8	1
36.5	University of Kansas	653	45	14.5	44.5	8.8	25	40.5	7	0
36.5	Michigan State University	653	72	9.1	77.5	2.8	92	20	6	1
38	University of Minnesota	633	27	23.4	24	12.4	14	7	8	1
39	University of Massachusetts	629	59	10.7	65	4.3	58	40.5	10	0
40	Carnegie-Mellon University	624	23	27.1	18.5	8.0	30	30	5	2
41	Temple University	618	54	11.4	62.5	4.2	60	—	2	1
42	Ohio State University	615	70	8.8	82	3.3	76.5	30	7	0
43	New School for Social Research	600	13	46.2	4	9.8	23	63	3	2
44	State University of New York at Buffalo	573	41	14.0	47.5	6.3	43	40.5	6	0
45	University of California, Santa Cruz	569	21	27.1	18.5	15.0	8	—	7	1
46	Indiana University	565	41	13.8	50.5	7.3	35	14	5	0
47	Vanderbilt University	549	39	14.1	46	5.3	48	40.5	6	1
48	University of Southern California	540	31	17.4	38	4.3	58	40.5	7	2
49	York University (Canada)	492	56	8.8	82	2.9	88.5	—	5	0
50	University of Georgia	490	53	9.3	76	2.3	>100	63	4	1

See footnotes at end of table, p. 1073.

(*table continued*)

TABLE 1—(*Continued*)

Rank	University	Total citations	Number of faculty	Mean citations	Rank based on mean	Median citations	Rank based on median	Roose & Andersen (1970) rating	Number of faculty with citations	
									>25	>100
51.5	University of Florida	473	58	8.2	88	2.2	>100	40.5	5	0
51.5	University of California, Davis	473	25	18.9	35.5	7.0	36.5	—	6	1
53	Washington State University	444	30	14.8	43	2.2	>100	63	1	1
54	University of Pittsburgh	443	42	10.6	66.5	5.2	49	40.5	4	0
55	University of British Columbia	437	37	11.8	60.5	8.0	30	—	4	0
56	University of Maryland	419	46	9.1	77.5	3.2	80	63	3	0
57	Boston University	413	46	9.0	79	4.5	55.5	63	4	0
58	Johns Hopkins University	410	17	24.1	22	14.0	12	16	7	1
59	Brown University	406	20	20.3	30	12.0	15.5	12	6	0
60	University of Iowa	399	33	12.1	59	8.0	30	20	4	0
61	Bowling Green State University	397	37	10.7	65	1.6	>100	—	6	1
62	University of Illinois at Chicago Circle	385	38	10.1	69	3.3	76.5	—	4	0
63.5	Princeton University	384	19	20.2	31	11.0	18.5	27	6	0
63.5	Massachusetts Institute of Technology	384	14	27.4	17	15.0	8	12	6	0
65	University of South Florida	377	26	14.5	44.5	4.0	64.5	—	5	1
66	University of Hawaii	364	26	14.0	47.5	4.8	54	—	6	0
67	Queens University at Kingston (Canada)	363	33	11.0	64	6.7	41	—	4	0
68	University of California, Santa Barbara	359	28	12.8	54	7.0	36.5	—	4	0
69	Wayne State University	353	70	5.0	>100	1.4	>100	—	3	0
70	University of Alberta (Canada)	341	29	11.8	60.5	2.8	92	—	4	0
71	University of Utah	320	47	6.8	99.5	3.3	76.5	63	3	0
72	McMaster University (Canada)	319	23	13.9	49	7.0	36.5	—	6	0
73	Washington University	305	24	12.7	55.5	2.8	92	63	4	0
75	Southern Illinois University	303	48	6.3	>100	2.5	>100	63	2	1
75	University of Sussex[d] (United Kingdom)	303	36	8.4	84	2.5	>100	—	4	0

See footnotes at end of table, p. 1073.

TABLE 1—(*Continued*)

Rank	University	Total citations	Number of faculty	Mean citations	Rank based on mean	Median citations	Rank based on median	Roose & Andersen (1970) rating	Number of faculty with citations	
									>25	>100
75	Florida State University	303	39	7.8	91	3.3	76.5	40.5	3	0
77	University of Virginia	278	36	7.7	92	2.3	>100	63	4	0
78	University of Missouri	262	28	9.4	76	5.0	52	63	3	0
79	Kent State University	252	30	8.4	86.5	2.0	>100	—	2	1
80	Syracuse University	250	34	7.4	94	2.5	>100	40.5	2	0
81	Emory University	240	19	12.6	57.5	6.9	38.5	63	3	0
82	Kansas State University	236	23	10.3	68	4.3	58	63	3	0
83	Ontario Institute for Studies in Education (Canada)	232	26	8.9	80.5	3.5	71.5	—	3	0
84	Carleton University (Canada)	220	36	6.1	>100	2.5	>100	—	2	0
85	Northeastern University	219	25	8.8	82	3.8	69	—	1	1
86	University of Cincinnati	210	55	3.8	>100	1.9	>100	63	1	0
87	University of Delaware	195	20	9.8	71.5	1.5	>100	—	2	1
88	Clark University	190	18	10.6	66.5	6.5	42	40.5	2	0
89	University of Bristol (United Kingdom)	189	15	12.6	57.5	4.0	64.5	—	3	0
90	Arizona State University	188	30	6.2	>100	2.5	>100	63	0	0
91	Dalhousie University (Canada)	184	22	8.4	86.5	4.0	64.5	—	2	0
92	State University of New York at Binghamton	177	26	6.8	99.5	2.5	>100	—	1	0
93	University of Birmingham (United Kingdom)	174	13	13.4	52	4.0	64.5	—	2	0
94	Case Western Reserve University	171	25	6.8	99.5	1.4	>100	63	2	0
95	Brandeis University	167	13	12.9	53	11.0	18.5	40.5	2	0
96	University of Denver	165	21	7.9	91	5.0	52	—	1	0
97	University of Manitoba (Canada)	163	46	3.5	>100	1.4	>100	—	1	0
98	University of California, Riverside	160	22	7.3	95	3.0	84.5	—	2	0
99	University of Arizona	156	29	5.4	>100	2.7	95.5	63	1	0
100	University of Miami	154	19	8.1	90	1.4	>100	63	2	0

[a] Department of Psychology and Social Relations.
[b] Department of Behavioral Science.
[c] Combining the affiliated colleges and teaching institutions.
[d] Combining the Departments of Experimental, Social, and Developmental Psychology.

TABLE 2

The 100[a] Most-Cited Psychologists in the 1975 Social Science Citation Index *and Their Institutional Affiliations*

Rank	Psychologist	Affiliation	Number of citations
1	S. Freud	Deceased	1,426
2	J. Piaget	University of Geneva, Switzerland	1,071
3	B. J. Winer	Purdue University	749
4	A. Bandura	Stanford University	650
5	H. J. Eysenck	University of London, United Kingdom	537
6	D. T. Campbell	Northwestern University	515
7	E. Goffman	University of Pennsylvania	514
8	B. F. Skinner	Harvard University	501
9	E. H. Erikson	Harvard University	494
10	S. Siegel	Deceased (formerly at Pennsylvania State University)	466
11	R. B. Cattell	University of Illinois[b]	428
12	J. P. Guilford	University of Southern California	392
13	C. R. Rogers	Center for Studies of the Person, La Jolla, California	387
14	J. B. Rotter	University of Connecticut	386
15	A. H. Maslow	Deceased (formerly at Brandeis University)	367
16	G. A. Miller	Rockefeller University	365
17	L. J. Cronbach	Stanford University	363
18	J. S. Bruner	Oxford University, United Kingdom	362
19	C. E. Osgood	University of Illinois	356
20	L. Festinger	New School for Social Research	350
21	D. E. Berlyne	Deceased (formerly at the University of Toronto, Canada)	349
22	A. R. Jensen	University of California, Berkeley	338
23	J. Kagan	Harvard University	337
24	S. S. Stevens	Deceased (formerly at Harvard University)	328
25	A. U. Paivio	University of Western Ontario, Canada	315
26	H. A. Witkin	Educational Testing Service, Princeton, New Jersey	314
27	R. Brown	Harvard University	311
28	M. Rokeach	Washington State University	306
29	L. Kohlberg	Harvard University	300
30	M. Rutter	University of London, United Kingdom	296
31	A. Campbell	University of Michigan	292
32	R. R. Carkhuff	American International College	291
33	D. Byrne	Purdue University	290
34	D. C. McClelland	Harvard University	288
35	H. A. Simon	Carnegie-Mellon University	286
36	C. G. Jung	Deceased	274
37	R. Rosenthal	Harvard University	273
38	H. H. Kelley	University of California, Los Angeles	269
39	E. E. Jones	Duke University[c]	263
40	J. Wolpe	Temple University	262
41	R. N. Shepard	Stanford University	257
42	W. Mischel	Stanford University	252
43	E. Tulving	University of Toronto, Canada	251
44	J. Bowlby	Tavistock Clinic, London, United Kingdom	250
45	D. E. Broadbent	Oxford University, United Kingdom	242
46	A. L. Edwards	University of Washington	241
47	M. J. Rosenberg	University of Chicago	237
48	M. Deutsch	Columbia University	225
49	K. Lewin	Deceased (formerly at the Massachusetts Institute of Technology)	222
51	G. W. Allport	Deceased (formerly at Harvard University)	221
51	N. H. Anderson	University of California, San Diego	221
51	B. J. Underwood	Northwestern University	221
53	Erich Fromm	Retired (formerly at the National University of Mexico)	220
54	H. G. Gough	University of California, Berkeley	217
55	W. L. Hays	University of Georgia	214

TABLE 2—(*Continued*)

Rank	Psychologist	Affiliation	Number of citations
56.5	M. Fishbein	University of Illinois	213
56.5	S. Schachter	Columbia University	213
58	D. Wechsler	New York University	212
59	A. Freud	Hampstead Child-Therapy Clinic, London, U. K.	210
60	J. W. Atkinson	University of Michigan	206
61	M. E. P. Seligman	University of Pennsylvania	205
62	J. H. Flavell	Stanford University	204
63	N. E. Miller	Rockefeller University	202
64	L. Berkowitz	University of Wisconsin, Madison	201
65	E. L. Thorndike	Deceased (formerly at Columbia University)	194
66	U. Neisser	Cornell University	193
67	J. Cohen	New York University	192
68	M. I. Posner	University of Oregon	191
69	D. J. Bem	Stanford University[d]	189
70	W. Labov	University of Pennsylvania	187
71	E. E. Maccoby	Stanford University	185
72	V. H. Vroom	Yale University	181
73.5	R. C. Atkinson	Stanford University	176
73.5	E. P. Torrance	University of Georgia	176
75	E. R. Hilgard	Stanford University	174
76.5	D. Kimura	University of Western Ontario, Canada	172
76.5	R. B. Zajonc	University of Michigan	172
78	G. H. Bower	Stanford University	166
79	P. Converse	University of Michigan	163
80	A. Rapoport	University of Toronto, Canada	160
81	L. Postman	University of California, Berkeley	157
82	J. J. Gibson	Cornell University	156
83	M. T. Orne	University of Pennsylvania	155
84	I. L. Janis	Yale University	154
85	N. H. Azrin	Southern Illinois University	151
86.5	D. O. Hebb	McGill University, Canada[e]	150
86.5	A. Mehrabian	University of California, Los Angeles	150
88	E. J. Gibson	Cornell University	149
88	K. D. O'Leary	SUNY at Stony Brook	149
89	W. R. Garner	Yale University	147
90	A. A. Lazarus	Rutgers—The State University	146
91.5	W. K. Estes	Rockefeller University	142
91.5	R. D. Luce	Harvard University	142
93	U. Bronfenbrenner	Cornell University	141
94	R. C. Bolles	University of Washington	138
95.5	M. Argyle	Oxford University, United Kingdom	136
95.5	E. F. Zigler	Yale University	136
98	H. H. Clark	Stanford University	135
98	E. Aronson	University of California, Santa Cruz	135
98	S. E. Asch	University of Pennsylvania	135
100.5	F. I. M. Craik	University of Toronto, Canada	134
100.5	F. E. Fiedler	University of Washington	134

[a] There are actually 102 names included in this table because two persons were tied at the 100th position and because K. D. O'Leary was inadvertently omitted and was inserted just before publication.
[b] Now also at the University of Hawaii.
[c] Now at Princeton University.
[d] Now at Cornell University.
[e] Now also at Dalhousie University, Canada.

several different objective measures of both impact and productivity to provide additional and more objective information than that provided by subjective rankings. We found that the top schools in terms of faculty cited were also the top schools in terms of faculty publishing, there being a correlation of .78 between these two measures. To a large extent this was quite independent of faculty size, for when the correlation was computed on means, the result was .56. The conclusion that can be made from Table 4 is that those departments that are high on one measure

TABLE 3

Ranking of the Top 100 British, Canadian, and U. S. Graduate Departments of Psychology by Total Number of Publications Produced by Faculty in the 1975 Social Science Citation Index

Rank	University	Total publications	Number of faculty	Mean publications	Rank based on mean	Roose & Andersen (1970) rating
1	University of London[a] (United Kingdom)	130	124	1.1	46	—
2	University of Illinois	115	85	1.4	21	5.0
3	University of Michigan	114	135	.8	97.5	2.0
4	City University of New York	104	124	.8	97.5	—
5	Yale University	100	60	1.7	5.5	7.0
6	Purdue University	84	69	1.2	34.5	40.5
7	Rutgers—The State University	82	77	1.1	46	40.5
8	University of Rochester	78	82	1.0	61.5	20.0
9.5	University of Colorado	75	49	1.5	14.5	14.0
9.5	University of Kansas	75	45	1.7	5.5	40.5
11	University of Georgia	74	53	1.4	21	63.0
12.5	University of California, Los Angeles	72	75	1.0	61.5	10.0
12.5	Stanford University	72	45	1.6	9.5	1.0
14	University of North Carolina	69	78	.9	77.5	24.0
15.5	Michigan State University	67	72	.9	77.5	20.0
15.5	University of Pittsburgh	67	42	1.6	9.5	40.5
17	State University of New York at Stony Brook	65	50	1.3	28	—
18	University of British Columbia (Canada)	64	37	1.7	5.5	—
19	Ohio State University	62	70	.9	77.5	30.0
20.5	Northwestern University	61	30	2.0	1.5	16.0
20.5	University of Washington	61	50	1.2	34.5	27.0
22	University of Wisconsin	59	37	1.6	9.5	7.0
23	University of Florida	56	58	1.0	61.5	40.5
24	University of Toronto (Canada)	55	52	1.1	46	—
25	University of Texas	53	42	1.3	28	11.0
26	University of Connecticut	52	38	1.4	21	40.5
27	University of Massachusetts	50	59	.9	77.5	40.5
28	University of Chicago[b]	49	54	.9	77.5	16.0
29	University of Pennsylvania	48	45	1.1	46	6.0
30	University of Cincinnati	46	55	.8	97.5	63.0
32	University of Illinois at Chicago Circle	45	38	1.2	34.5	—
32	Vanderbilt University	45	39	1.2	34.5	40.5
32	University of Manitoba (Canada)	45	46	1.0	61.5	—
34.5	Pennsylvania State University	44	39	1.1	46	16.0
34.5	University of Maryland	44	46	1.0	61.5	63.0
36.5	Florida State University	43	39	1.1	46	40.5
36.5	Cornell University	43	49	.9	77.5	20.0
38.5	University of Missouri—Columbia	42	28	1.5	14.5	63.0
38.5	University of Southern California	42	31	1.4	21	40.5
40	Temple University	41	54	.8	97.5	—
41	Harvard University[c]	40	41	1.0	61.5	4.0
43.5	University of California, Berkeley	39	35	1.1	46	3.0
43.5	Southern Illinois University	39	48	.8	97.5	63.0
43.5	York University (Canada)	39	56	.7	>100	—
43.5	University of Western Ontario (Canada)	39	43	.9	77.5	—
46.5	Indiana University	38	41	.9	77.5	14.0

TABLE 3—(*Continued*)

Rank	University	Total publications	Number of faculty	Mean publications	Rank based on mean	Roose & Andersen (1970) rating
46.5	McGill University (Canada)	38	37	1.0	61.5	—
48.5	University of Alberta (Canada)	37	29	1.3	28	—
48.5	State University of New York at Buffalo	37	41	.8	97.5	40.5
50.5	University of California, San Diego	36	21	1.7	5.5	—
50.5	Carnegie-Mellon University	36	23	1.6	9.5	30.0
52	Wayne State University	35	70	.5	>100	—
54	University of Oregon	34	33	1.0	61.5	24.0
54	Iowa State University	34	31	1.1	46	63.0
54	University of Waterloo (Canada)	34	44	.8	97.5	—
56.5	University of Minnesota	33	27	1.2	34.5	7.0
56.5	Virginia Polytechnic Institute and State University	33	24	1.4	21	—
58	Bowling Green State University	32	37	.9	77.5	—
59.5	University of South Florida	31	26	1.2	34.5	—
59.5	Oxford University (United Kingdom)	31	16	1.9	3	—
61	Duke University	30	29	1.0	61.5	24.0
62.5	University of Virginia	29	36	.8	97.5	63.0
62.5	Queens University at Kingston (Canada)	29	33	.9	77.5	—
64.5	University of Missouri—Kansas City	28	19	.7	>100	—
64.5	University of Iowa	28	33	.8	97.5	20.0
69	Ohio University	27	28	1.0	61.5	63.0
69	University of Sussex[d] (United Kingdom)	27	36	.8	97.5	—
69	New York University	27	42	.6	>100	30.0
69	Kent State University	27	30	.9	77.5	—
69	University of Alabama	27	19	1.4	21	—
69	Carleton University (Canada)	27	36	.8	97.5	—
69	Princeton University	27	19	1.4	21	27.0
74.5	Washington University	26	24	1.1	46	63.0
74.5	University of California, Davis	26	25	1.0	61.5	—
74.5	Johns Hopkins University	26	17	1.5	14.5	16.0
74.5	University of Aberdeen (United Kingdom)	26	26	1.0	61.5	—
78	University of Colorado	25	33	.8	97.5	—
78	Claremont College	25	33	.8	97.5	63.0
78	University of Calgary (Canada)	25	28	.9	77.5	—
81.5	Kansas State University	24	23	1.0	61.5	63.0
81.5	Case Western Reserve University	24	25	1.0	61.5	63.0
81.5	University of Utah	24	47	.5	>100	63.0
81.5	University of California, Santa Barbara	24	28	.9	77.5	—
84.5	Oklahoma State University	23	21	1.1	46	—
84.5	State University of New York at Binghamton	23	25	.9	77.5	—
87.5	University of Hawaii	22	26	.9	77.5	—
87.5	Brown University	22	20	1.1	46	12.0
87.5	Arizona State University	22	30	.7	>100	63.0
87.5	University of Denver	22	21	1.1	46	—
91	Emory University	21	19	1.1	46	63.0
91	George Peabody College for Teachers	21	28	.8	97.5	63.0
91	Syracuse University	21	34	.6	>100	40.5

TABLE 3—(*Continued*)

Rank	University	Total publications	Number of faculty	Mean publications	Rank based on mean	Roose & Andersen (1970) rating
94.5	Washington State University	20	30	.7	>100	63.0
94.5	New School for Social Research	20	13	1.5	14.5	63.0
94.5	Ontario Institute for Studies in Education (Canada)	20	26	.8	97.5	—
94.5	Memorial University of Newfoundland (Canada)	20	29	.7	>100	—
98.5	University of Nottingham (United Kingdom)	19	15	1.3	28	—
98.5	University of Bristol (United Kingdom)	19	15	1.3	28	—
98.5	University of Oklahoma	19	17	1.1	46	—
98.5	University of California, Santa Cruz	19	21	.9	77.5	—

[a] Combining the affiliated colleges and teaching institutions.
[b] Department of Behavioral Science.
[c] Department of Psychology and Social Relations.
[d] Combining the Departments of Experimental, Social, and Developmental Psychology.

tend to be high on the others. Indeed, we found that the number of citations that a department had accumulated correlated over .6 with ratings of "quality" that chairpersons had assigned some 6 years earlier. This was true regardless of whether we looked at citations in terms of the total, the mean, or the median. When we consider the amount of possible error variance and the years intervening between the two studies, this is quite impressive evidence for consistency and suggests the operation of a sort of 'g' factor for university departments of psychology. However, the number of publications a department produced had a much lower loading on the reputation of quality that a department had acquired for itself, a finding in accord with data reported by Cox and Catt (1977). This suggests that number of publications may not be as good a measure of quality as are citations.

It is interesting to speculate as to why the number of citations correlates so highly with the reputational rank of departments, especially when one considers that the ranks were determined some 6 years prior to the 1975 SSCI data of our study. One possible hypothesis to account for this high correlations may be that when one rates a department, one attempts to think of the highly cited, "visible" members of the department and then rates the department according to the number of such individuals who can be retrieved from memory. This would explain, for example, why the University of Michigan receives such high

TABLE 4

Intercorrelations Among All Measures of "Quality"

Measure	1	2	3	4	5	6	7	8	9
1. Faculty size (n = 180)	1.00	.67**	.26**	.19*	.85**	.17*	.33*	.43**	−.10
2. Total citations (n = 180)		1.00	.81**	.71**	.78**	.42**	.69**	.57**	.27*
3. Mean citations (n = 180)			1.00	.88**	.49**	.56**	.64**	.27*	.35*
4. Median citations (n = 180)				1.00	.43**	.50**	.67**	—	—
5. Total publications (n = 180)					1.00	.59**	.51**	.63**	.15
6. Mean publications (n = 180)						1.00	.39**	.38*	.45**
7. Roose & Andersen (1970) ratings (n = 73)							1.00	.56**	.42*
8. Cox & Catt (1977) total publications (n = 49)								1.00	.73**
9. Cox & Catt (1977) mean publications (n = 49)									1.00

* $p < .05$.
** $p < .001$.

ratings in polls—second in the Roose and Andersen (1970) ratings—while coming out ranked at 21 in terms of mean citations and 27.5 in terms of median citations. The University of Michigan has a large number of highly cited people (40 with more than 25 citations, 6 with more than 100 citations), but 95 members of the department have fewer than 25 citations. It seems likely that the University of Michigan receives its high ranking because it has so many well-known psychologists, despite the fact that they are scattered among many who are less well-known. Of the University of Michigan's 135 faculty, 53 had fewer than five citations in the 1975 SSCI. Thus, it may be that reputational rank is based on the number of highly cited individuals in a department, regardless of how many others there are. This would explain the high correlation between total citations and reputational rank.

In some cases, our determination of faculty size was heavily influenced by including a large number of cross-appointments and adjunct appointments. Often these psychologists seemed to be clinical psychologists primarily engaged in private practice who would not be expected to have many citations, since they were not heavily engaged in scholarly research. Including a large number of these individuals, as was done with Ohio State University, the University of North Carolina, and the University of Rochester, among other institutions, can greatly pull down the mean or median number of citations. In some cases, using total citations alleviated this problem of numerous clinical adjunct professors. Of course, there were also cases in which the total number of citations of faculty in a department was greatly affected by a cross-appointment. For example, the University of Pennsylvania received 514 of its 2,033 citations for E. Goffman, whose primary appointment is in another department. Similarly, Temple University received 262 of its 618 citations for J. Wolpe, who is an adjunct professor.

One concern with the use of total citations lies in the extent to which the measure is influenced by the presence of one or two outstanding individuals. To take but some examples, at Northwestern University, D. T. Campbell contributed 47% of all citations, while the top two individuals (Campbell and Underwood) contributed 67%. At Oxford University, J. S. Bruner contributed 41%; at the New School for Social Research, L. Festinger contributed 58%; at Purdue University, B. J. Winer contributed 41%; at Northeastern University, M. Sidman contributed 51%; and at the University of Western Ontario, A. U. Paivio contributed 37%. Even at Stanford University, A. Bandura contributed 18%, and at the University of Pennsylvania, E. Goffman, who, as mentioned, is a cross-appointment, contributed 25%. Thus at most schools, the top few individuals may account for 50% or more of the total citations.

TABLE 5

Frequencies and Cumulative Percentage Frequencies for the Distribution of 1975 Social Science Citation Index *Citations of, and Publications by Faculty Members at the Top 100 British, Canadian, and American Graduate Departments of Psychology Listed in Table 1*

Number of citations or publications	Citations		Publications	
	Frequency	Cumulative percentage frequency	Frequency	Cumulative percentage frequency
>100	134	100	—	—
26–99	556	97	—	—
21–25	164	83	1	100
16–20	223	79	1	99
11–15	338	74	1	99
10	97	65	3	99
9	82	63	4	99
8	102	61	12	99
7	105	58	18	99
6	125	56	37	99
5	187	53	54	98
4	187	48	147	97
3	207	44	259	93
2	302	38	468	87
1	365	31	971	75
0	896	22	2,094	52
Total	4,070		4,070	

Using the mean number of citations does not completely overcome this problem because the distribution of citations is so skewed. Since most people in a department have very few citations, the departmental mean also reflects the impact of a few highly cited individuals. The mean number of citations is especially problematic in the case of a relatively small department with one highly cited individual. This is illustrated by the case of the New School for Social Research, where L. Festinger had 350 citations in 1975. Since there are 13 faculty members listed in their catalog as members of the Department of Psychology, Festinger's presence brings the mean up from 20.8, which is still quite high, to 46.2. Thus, the mean number of citations also has its drawbacks as a measure of departmental impact.

The median number of citations circumvents the "problem" of having a few highly cited individuals in the department. A case can be made

that it is the best measure, since it is impervious to these extremes and yet still correlates quite highly with reputational rank. Once again, the primary problem is that the median of some small departments may be quite high, despite the fact that their overall impact must be considered low simply because there are few faculty members.

The measures of *productivity*—total, mean, and median number of publications—did not correlate as highly with reputational rank as did the impact measures. However, a case can be made that the total or mean number of publications is a good estimate of the quality of a department. (Median number of citations is not a useful measure, since the amount of variation among departments is so slight. The range for all 180 schools in our study was from 0 to less than 2.) The argument for productivity measures runs something like this: Citation measures are based on the scientific maturity of members of a department. The most highly cited individuals are older, full professors, who may not be currently active or in the forefront of new discoveries in the field. The greatest intellectual stimulation and excitement may occur in departments where there are younger people who may not be receiving large numbers of citations but who *will be* in future years for work currently being done. The total or mean number of publications may be one indicator, however imperfect, of this intellectual stimulation. By examining productivity measures, rather than impact measures, one may gain some idea as to which institutions are currently generating the most research. The drawback, of course, is that one cannot know whether the research is important or interesting simply by counting the number of publications. What this may imply is that there is no way to assess the quality of work being done at different graduate departments of psychology until years later. We may not be able to rank the impact of faculty members of a department in 1975 until the impact of the work can be ascertained in, say, 1995. On the other hand, as we have already noted, there is a very high positive correlation between institutions of high productivity and those of high impact, and Albert (1975) has noted that in a large number of fields (art and music, as well as science), one characteristic of the highly impactful worker (often called a "creative genius") is immense productivity.

In discussing the various measures of impact and productivity of graduate psychology departments, we have argued that while each has a certain usefulness (except median number of publications), each also has associated drawbacks. As the reader will have noticed by this point, the real difficulty is that we have no generally accepted criterion for deciding the quality of a graduate department of psychology, even if we limit ourselves only to considerations of research quality. Is a good department one with the most highly cited individuals? It is one with the greatest average impact of faculty members? Is it one with the most productive members? Presumably, all these components and others must be considered in judging the quality of a department. It should also be noted that we are not considering here other valid considerations in judging departmental quality, such as the quality of instruction and service to the community.

It seems clear from the difficulties we and others (e.g., Buss, 1976; Endler, 1977, 1978) have raised regarding the use of citation and publication counts that one must view their use with caution and judgment. For example, by most measures of impact, the psychology department at Stanford University emerges as extremely distinguished. However, it is not the most desirable department in which to pursue graduate study in certain specialties in psychology, such as clinical or organizational–industrial psychology. It would be a very interesting undertaking, but one quite beyond the scope of this article, to provide impact and productivity rankings for departments in content specialties (developmental, social–personality, animal behavior, cognitive, etc.).

The results of the present study agree with those of others (Endler, 1977; Rushton & Endler, 1977) in showing that the work of a very small number of psychologists is responsible for most of the citations in psychology. Of the 4,070 psychologists at the top 100 departments listed in Table 1, only 707 (17%) received 25 or more citations, and only 135 (3%) received 100 or more citations. These percentages would of course be much lower were we to include all 180 departments of psychology rather than just the top 100. In a citation analysis of all the university departments in the United Kingdom, Rushton and Endler (1977) reported that nearly 50% of citations accrued to the two leading departments and that the top three individuals were responsible for 20% of all citations received by British psychologists. One inference to be drawn from figures such as

these is that a very small number of psychologists is responsible for progress made in the field.

Eighteen of the top 100 departments of psychology listed in Table 1 are located in Canada or the United Kingdom (13 in Canada, 5 in the United Kingdom). The top British schools were the University of London with a total of 1,570 citations and Oxford University with 886. If median number of citations is used instead of totals, then Oxford University was the second best department immediately following Stanford University. The top Canadian schools in terms of total citations were the University of Toronto (1,598), McGill University (849), the University of Western Ontario (841), the University of Waterloo (707), and York University (492). On the other hand, it is quite clear that the majority of citations are of psychologists at schools in the United States. In addition, there is far less concentration of frequently cited psychologists in a few schools in the United States than there is in Britain or Canada, where, respectively, the top 2 and 4 departments account for 50% of all the citations (Endler, 1977; Rushton & Endler, 1977). Thus, it is the United States that is having the greatest impact on contemporary psychology. It might well be, however, that this impact is partly due to the multiplier effect of quantity on quality. The number of "superstars" in Table 2 from both Canada and the United Kingdom attests to the quality that these other countries are capable of producing. Thus, from Canada there are A. U. Paivio, E. Tulving, D. Kimura, A. Rapoport, D. O. Hebb, F. I. M. Craik, and the late D. E. Berlyne. From the United Kingdom there are H. J. Eysenck, J. S. Bruner, R. Rutter, J. Bowlby, D. E. Broadbent, A. Freud, and M. Argyle. In some ways, however, such comparisons are invidious; they are, in addition, much complicated by the movement of individuals across national borders. For example, Bruner, now at Oxford University, was originally at Harvard University, and Craik, now at the University of Toronto, was originally at the University of London. Another complicating factor in such cross-national comparisons is that while *all* 35 graduate departments of psychology in Canada were evaluated, as were all 45 in the United Kingdom, only 100 departments in the United States were out of more than 400 possible ones (American Psychological Association, 1974). Of these, however, only 206 grant PhDs (Kiesler, Note 2). If all United States graduate departments had been evaluated, the percentage of United States institutions listed might have been even higher. It may well be that some departments that would have been ranked in the top 100 in terms of total citations or other measures were inadvertently omitted from our study. Unfortunately, the effort necessary to provide citation and publication analyses on *all* graduate departments in the United States was prohibitive, and we had to select only those departments that seemed the most likely candidates for high productivity or impact. Our primary sources were the Roose and Andersen (1970) study of reputational rank and the Cox and Catt (1977) study of productivity.

The measures of scientific impact of psychology departments in our study correlated quite highly with the reputational ranks Roose and Andersen (1970) obtained on 76 United States departments. However, our results show that a number of departments in the United States were omitted from the Roose and Andersen (1970) study. Twelve United States schools that were included in our top 82 schools in terms of total citations were not included in Roose and Andersen's study: the City University of New York, the State University of New York at Stony Brook, Rockefeller University, the University of California, San Diego, Temple University, the University of California, Davis, Bowling Green State University, the University of Illinois at Chicago Circle, the University of South Florida, the University of Hawaii, the University of California, Santa Barbara, and Wayne State University. Many of these departments are relatively new, and thus one could not have expected them to be included in the Roose and Andersen study, which was actually conducted in 1969. However, nine of the 76 departments in the Roose and Andersen study did not rank in our top 100 in terms of total citations: Ohio University, the University of Tennessee, the University of New Mexico, Claremont College, George Peabody College for Teachers, Iowa State University, Bryn Mawr College, the University of Nebraska, and Tulane University. Several of these departments were included in the top 100 on other measures. (We were unable to obtain faculty lists for two schools included in the Roose and Andersen study: Tufts University and Yeshiva University. The California Institute of Technology was not included, since it has only one full-time member of the psychology department.)

Our ranking of schools in terms of total citations correlated with the Cox and Catt (1977) rank

ordering in terms of total publications in APA journals over a 5-year period. As can be seen from Table 4, the correlation between our measure of total citations and their ranking by mean publications was .27. The total and mean publications as derived from the 1975 SSCI correlated .63 and .38, respectively, with the Cox and Catt (1977) total publications and .15 and .45 with Cox and Catt's mean publications. Thus, despite the radically different sampling procedures used in the two studies, and the fact that publications are a little more unstable as a measure than citations (Endler, in press), there is some degree of commonality. It is clear from Table 4 that citations are a more stable measure in terms of (a) loadings on Roose and Andersen (1970) ratings and (b) intercorrelations with other citation measures based on means and medians.

It seems that citation counts are potentially extremely useful in providing an objective of the impact of work of both individual faculty members and of departments. As has been recognized elsewhere, citation counts are highly correlated with many measures of quality (Cole & Cole, 1971; Endler, in press; Garfield, 1977a, 1977b, 1977c; Myers, 1970; Wade, 1975). It should, of course, be remembered that research is only one facet of a faculty member's impact and that many academic psychologists and departments make important contributions to their profession and community in terms of teaching, administration, and applied work.

Since going to press, it has been announced that Herbert A. Simon, professor of psychology at Carnegie-Mellon University, has been awarded the 1978 Nobel Prize in the economics category. He is the first full member of a psychology department to win the Nobel. (Conrad Lorenz, Nikolas Tinbergen, and Karl von Frisch, who shared one in 1974 in the physiology-or-medicine category, were ethologists and were not members of psychology departments.) Professor Simon, the authors are pleased to note, appears in Table 2 of this article, with 286 citations. We offer him our hearty congratulations.

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