

## BRIEF REPORTS/RAPPORTS BREFS

### Evidence for the Predictive Utility of Aggregated Citations in Canadian Psychology

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In recent years a number of studies have used the *Social Science Citation Index* (SSCI) to examine the productivity and impact (citations) of psychology departments in Canada. The growth of citation analysis in psychology has resulted in a concern over the validity of this procedure. Some data on the reliability and validity of citation counts have been provided for both individuals and departments in both psychology and other sciences (e.g., Endler, Rushton & Roediger, 1978; Rushton & Endler, 1979). The aim of the current paper is to provide additional data regarding the predictive utility of aggregated citation counts at the department level.

#### Method

Twenty-seven disparate measures were obtained on a total of 31 Canadian universities (see Rushton & Meltzer, 1979), including nineteen measures of the entire university, and eight measures concerning only psychology departments. Concerning the entire university, estimates of each institution's total publication output in the physical sciences, humanities, and behavioural sciences were taken from the 1977 *Corporate Indices of the Science Citation Index* (SCI), *Arts and Humanities Citation Index* (A & HCI), and the SSCI, respectively. Additional data were derived from either the 54th edition of the *Commonwealth Universities Yearbook* (1977) or from the 1978 *World Almanac and Book of Facts*, including: the year the university was founded, the total financial revenue of that university (usually for the academic year 1975-76), the number of bound volumes in the library

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system, the total number of full time students (graduate and undergraduate combined), and the number of graduate students. The faculty size was derived from the *World Almanac*.

Concerning psychology departments specifically, eight measures were obtained from the Endler (1977) and Endler, Rushton and Roediger (1978) studies. These measures were: total, mean and median number of 1975 SSCI citations, the number of faculty with greater than 25 and 100 citations, the total and mean number of 1975 SSCI publications, and the faculty size of the psychology department.

Pearson product moment correlations were calculated between all variables. The total correlation matrix was then factored by a principle components analysis with unities in the diagonal.

#### Results and Discussion

Six universities were found to account for 51% of 24,233 Canadian scholarly publications. These were: the University of Toronto, the University of British Columbia, McGill University, the University of Alberta, the University of Western Ontario, and McMaster University (see Rushton & Meltzer, 1979 for full details). These universities were found to be comparable to the most productive universities in both Britain and the United States (Rushton & Meltzer, Note 1).

A powerful general factor accounting for 60% of the total variance was discovered to permeate the 27 disparate measures: those universities which were high on one measure tended to be high on others. This general factor could be labelled a dimension of quality, wealth, or size. The general factor that emerges from the Canadian data is paralleled by the studies carried out on the British and United States samples cited above.

As can be seen in Table 1 the results of this study indicate clearly the predictive utility of citation counts. By knowing the total number of citations accruing to all the members of the psy-

TABLE 1

Correlations Between University Level Variables and  
Measures of Departmental Size and Scientific Impact

	Psychology Department Data (1975) <sup>a</sup>						Average <i>r</i>
	1	2	3	4	5	6	
	Total Citations to Psychology Faculty	Psychology Faculty Size	Mean Citations to Psychology Faculty	Number of Psychology Faculty with >25 Citations	Total Publications of Psychology Faculty	Mean Publications of Psychology Faculty	
Data on Entire University (1977) <sup>b</sup>							
1. Total publications (A & HCI + SCI + SSCI)	.88	.62	.87	.82	.82	.62	.77
2. Total university faculty size	.68	.72	.64	.62	.77	.55	.66
3. Mean publications (A & HCI + SCI + SSCI)	.63	.45	.77	.73	.62	.54	.62
4. Total A & HCI publications	.88	.69	.78	.76	.79	.52	.74
5. Mean A & HCI publications	.38	.27	.38	.38	.33	.24	.33
6. Total SSCI publications	.86	.72	.84	.82	.88	.63	.79
7. Mean SSCI publications	.66	.35	.72	.66	.63	.51	.59
8. Total SCI publications	.82	.57	.85	.80	.79	.65	.75
9. Mean SCI publications	.54	.35	.72	.66	.56	.58	.57
10. University revenue	.72	.71	.65	.62	.71	.42	.64
11. Year university was founded	-.30	-.06	-.33	-.28	-.17	-.18	-.22
12. Number of volumes in library	.74	.62	.74	.71	.75	.55	.69
13. Number of current periodicals	.64	.65	.62	.61	.64	.43	.60
14. Total number of students	.65	.79	.60	.56	.68	.43	.62
15. Total student/faculty ratio	.13	.33	.11	.09	.09	.00	.13
16. Total number of undergraduate students	.52	.75	.51	.46	.63	.45	.55
17. Undergraduate student/faculty ratio	-.11	.14	-.10	-.14	-.12	-.10	-.07
18. Total number of graduate students	.84	.75	.72	.71	.69	.33	.67
19. Graduate student/faculty ratio	.55	.63	.48	.50	.45	.11	.45
Average <i>r</i>	.60	.54	.59	.56	.57	.40	.54

## NOTE:

All correlations over  $r = .35$  are significant at  $p < .05$  for a two-tailed test for  $N = 31$ .

<sup>a</sup>Data based on Endler (1977) and Endler, Rushton and Roediger (1978).

<sup>b</sup>Data based on Rushton and Meltzer (1979).

chology department, one may predict the overall productivity of the entire university, the number of books in the library, the number of periodicals currently subscribed to, the total number of graduate and undergraduate students, the faculty size, and the total university revenue (average  $r =$

.60). Knowing merely how many members of the psychology department had greater than 25 citations also allowed prediction of these same variables (average  $r = .56$ ). The faculty size of the psychology department is also a valid predictor of the same variables ( $r = .54$ ).

### RESUME

Des données sont fournies sur la valeur prédictive, au niveau des départements, des calculs de citations cumulées. On a constaté que le nombre de citations des départements de psychologie dans leur ensemble permet de prédire diverses caractéristiques de leur université y compris: le nombre total de publications émanant de leurs facultés des arts et des humanités, des sciences sociales, des sciences, les revenus de l'université, le nombre d'abonnements à des périodiques courants, le nombre de volumes reliés de la bibliothèque, et le nombre d'étudiants pré-diplômés et diplômés.

### Reference Note

Rushton, J. P., & Meltzer, S. *Research productivity, university revenue, and scholarly impact (citations) of 169 American, British and Canadian universities (1977)*. Unpublished manuscript, The University of Western Ontario, 1980.

### References

*Arts and Humanities Citation Index*. Philadelphia, Pa.: Institute for Scientific Information, 1977.  
*Commonwealth Universities Yearbook 1977-78* (54th Edition). London, England: Association of Commonwealth Universities, 1977.  
 Endler, N. S. Research productivity and scholarly impact of Canadian Psychology Departments. *Canadian Psychological Review*, 1977, 18, 152-168.

Endler, N. S., Rushton, J. P., & Roediger, H. L. III. Productivity and scholarly impact (citations) of British, Canadian and American Departments of Psychology (1975). *American Psychologist*, 1978, 33, 1064-1082.  
 Rushton, J. P., & Endler, N. S. Assessing impact (quality?) in psychology: The use of citation counts. *Personality and Social Psychology Bulletin*, 1979, 5, 17-18.  
 Rushton, J. P., & Meltzer, S. Research productivity, university revenue, and scholarly impact (citations) of 31 Canadian universities (1977). *Canadian Journal of Higher Education*, 1979, 9, 74-81.  
*Science Citation Index*. Philadelphia, Pa.: Institute for Scientific Information, 1977.  
*Social Science Citation Index*. Philadelphia, Pa.: Institute for Scientific Information, 1975, 1977.  
*World Almanac and Book of Facts*, 1978. New York, N.Y.: Newspaper Enterprise Association, 1977.