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1964

PSYCHOLOGY IN CANADA

by

M. H. Appley and Jean Rickwood
Canadian Psychological Association

CORRIGENDA

P. 4, 5th line, 1:19 should read 1:1.9

P. 21, last three lines of Table 12 should read as follows:

Total.....	232	(80)	\$ 1,220	189	(67)	\$ 672
Percentage of Work Force..	17.5			14.3		
Percentage of Academic Psychologists.....		(19.8)			(16.6)	

P. 79, Table 38, 2. Increase in no. of PRI's² should read 2. Increase in no. of PRI's¹

P. 121, 4th line, Table 36 should read Table 37

PSYCHOLOGY

IN CANADA

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by

M. H. Appley and Jean Rickwood

ANALYZED

Special Study No. 3
September 1967

This is a technical study which was commissioned by the Science Secretariat and which was presented to the Science Council of Canada at its meeting of 19 June 1967. Although this study is published under the auspices of the Science Secretariat any opinions expressed *are those of the authors themselves* and should not be attributed to the Science Secretariat or to the Government of Canada.

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FOREWORD

The Science Secretariat, Privy Council Office, Ottawa has commissioned a number of studies in the various disciplines and fields of science in Canada. Many of these studies have been initiated at the request of the Science Council of Canada to assist it in developing broad recommendations for science in Canada, a major duty for which it was constituted.

The purpose of this study is to present a status report on the field of psychology in Canada in 1966. Hitherto comprehensive data have not been available from which a reasonably clear picture of Canadian psychology could be drawn and upon which future programs could be meaningfully developed. In response to the need for such data the Science Secretariat commissioned the Canadian Psychological Association to answer the following questions:

- (1) Who are the psychologists in Canada? Where are they located? In what areas do they work?
- (2) How many graduate students are there in the field? Where are they located?
- (3) What proportion of the psychological community is engaged in research? How many can be expected to be engaged in research 5 years hence? How many 10 years hence? What proportion of research can be identified as "pure" and as "applied"?
- (4) What is the current research support picture? Can a meaningful forecast be made of research needs 5 years hence? 10 years hence?

The Canadian Psychological Association charged Drs. M. H. Appley and Jean Rickwood of York University, Toronto, with carrying out the study. The report of their findings follows.

J. R. WEIR,
Director, Science Secretariat.

PREFACE

In carrying out this study of Canada's psychologists the authors were especially concerned, in accordance with their mandate from the Science Secretariat, with attempting to ascertain those characteristics of Canada's psychological community that would be pertinent to a forecast of its needs in the coming decade.

Recognizing that predictions could only be tentative in this period of often unexpected exponential developments in science—and that predictions must be particularly uncertain in a frontier area such as psychology—the major objective of the study was taken to be the development of a factual base line against which changes disclosed by future data might be measured and assessed.

To meet this objective a number of psychological and government personnel cooperated in developing, distributing, and analyzing an extensive three-part Questionnaire (see Appendix 1) sent to all identifiable psychologists in Canada and an additional questionnaire (see Appendix 2) sent to the Chairmen of Psychology Departments of Canadian Universities.

With the basic data in hand, the authors of the *Study* and its supplementary chapters were concerned to call attention to factors which currently appear likely to affect the condition and needs of psychologists in Canada in the next few years.

The Professional Manpower Survey of Psychologists was undertaken with the cooperation of Dr. J. P. Francis, Director of the Economics and Research Branch of the Department of Labour and jointly with Mr. K. V. Pankhurst and his staff in what is now the new Federal Department of Manpower and Immigration. The members of the Research Finance Committee of the Canadian Psychological Association which undertook the responsibility for this report on the results of the Survey of Psychologists and of the supplementary survey of Psychology Department Chairmen are:

Neil McK. Agnew, Ph.D., Director of Psychological Services, York University.

Mortimer H. Appley, Ph.D., Dean of the Faculty of Graduate Studies, York University. (Chairman)

Gilles A. Auclair, Ph.D., Professor of Psychology, University of Montreal.

M. David Belanger, Ph.D., Professor and Chairman, Institute of Psychology, University of Montreal.

David E. Berlyne, Ph.D., Professor of Psychology, University of Toronto.

Raymond G. Berry, M.A., Adviser in Psychology, Department of Health, Province of Ontario.

Dalbio Bindra, Ph.D., Professor of Psychology, McGill University.

John B. Boyd, M.A., Manager, Personal Research, Ontario Hydro-Electric Power Commission.

Wesley H. Coons, Ph.D., Professor of Psychology, York University.

Kurt Danziger, D. Phil., Professor and Acting Chairman, Department of Psychology, York University.

Rev. Robert C. Fehr, Ph.D., Professor and Head, Department of Psychology, University of Windsor.

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Russell S. MacArthur, Ph.D., Professor of Educational Psychology, University of Alberta.

C. Roger Myers, Ph.D., Professor and Head, Department of Psychology, University of Toronto.

P. Lynn Newbigging, Ph.D., Professor of Psychology, McMaster University.

Jean Rickwood, Ph.D., Assistant Professor of Psychology, York University.
(Secretary)

The writers received substantial assistance in all phases of the project from the other Committee members, for which they wish to express their appreciation. Dr. Rickwood was responsible for the collection and analyses of the survey data, with the assistance of a small project staff at York University and with the cooperation of Mr. S. Fisher and other associates of Mr. Pankhurst in the Research Section of the Department of Manpower and Immigration, to all of whom also our thanks are due and warmly paid. Of the York staff, special appreciation is expressed to Mrs. Barbara Goudie and Mrs. Lillian Kindree for their excellent secretarial help, and to Mr. Richard Riley, Dr. W. Fraser, and Mr. Paul Herzberg of the Computer Services Centre.

Acknowledgment of specific assistance from The Research Financing Committee members is made in Appendix 3, which describes the Survey procedures. Their additional major contribution is manifest in Part 2 wherein they severally comment on the Study results with respect to the special concerns of the sub-fields within psychology.

Responsibility for any bias that may have entered into the selection of data for presentation in this Report or in the interpretation of findings must rest with the authors alone.

M. H. A.

J. R.

Toronto, Ontario

June, 1967

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Part 1

SURVEY

Chapter 1

EMPLOYMENT CHARACTERISTICS

1.1 Professional Manpower Survey of Psychologists

This section reports the data from the first part of the three-part questionnaire (Appendix 1) that was developed by the Research Branch of the Department of Manpower and Immigration and the Research Financing Committee of the Canadian Psychological Association and distributed to all identifiable psychologists in Canada. The survey procedures are described in Appendix 3. The data are given on the basis of returns from 82.8% of the total identifiable population of active psychologists (excluding students) in Canada.

1.2 Number of Psychologists in Canada

Many sources of names were utilized to achieve a comprehensive coverage of the psychological community (Appendix 3). In an effort to ensure that the questionnaire would reach almost every psychologist in Canada, nominations were sought from likely employers of psychologists and from individual psychologists to expand the initial mailing list derived from professional associations, professional registries, and university psychology staff lists. As a result of this procedure the unduplicated list of 2,116 persons included some who were subsequently removed because they were untraceable by the post office, foreign residents, inactive, or disclaimed the status of psychologist (see Appendix 3). After these names were removed there was a net population of 1,708 persons, of whom 1,323 reported to the questionnaire and 385 did not. Subsequent telephone sampling of non-respondents indicated that 110 of them were also inappropriately included in the survey. The total number of persons removed from the original list was then 518 (94 untraceable, 202 foreign residents, 102 inactive, and 120 non-psychologists). From the resulting figure of 1,598 the total round number of psychologists in Canada is estimated to be 1,600¹.

A rough comparison of this estimate with United States figures for total psychologist population indicates that Canada has proportionately fewer psychologists. No exact comparable figures are available, but the size of the American psychological community has been conservatively estimated on analyses of data available to the Manpower Office of the American Psychological

¹For purposes of comparison with data from future surveys it should be mentioned that there is some reason to suspect that perhaps some of the respondents—see section 1.5—are not appropriately included. Unfortunately, an item once considered for the questionnaire, asking whether or not the respondent identified himself as a psychologist, was not retained in the final version, and there are therefore no certain grounds for excluding this number. Against this consideration, there is of course the probability that at least a few psychologists in Canada remain unidentified. Furthermore, approximately 50 full-time-equivalent personnel are added to the professional work force by way of secondary and occasional additional employment of full-time psychologists—see section 1.11.

Association¹. Correcting for population differences (on a ratio of 1:10), Canada could be expected to have 3,200 psychologists, or approximately twice the present number.

This difference between Canada and the U.S. is just slightly greater than that recently reported for physicists² (1:2 vs. 1:19) and may be paralleled in other fields as well.

1.3 Distribution of Psychologists by Province

Table 1 shows the number of respondents and the estimated total numbers of psychologists in each province. The latter figures represent the respondents plus the number of non-respondent psychologists in each province estimated on the basis of results of the sampling of non-respondents (See Appendix 3). Estimates of the number of psychologists per 100,000 population are calculated on the basis of 1965 census figures of the Dominion Bureau of Statistics.

Table 1—Distribution of Psychologists by Province and Ratios of Psychologists to Populations

Province	Number	Percentage	Number per 100,000 population	Number and Percentage in academic settings	
				Number	Percentage
Newfoundland.....	6	.4	1.2	4	67
Prince Edward Island.....	3	.2	2.8	0	0
Nova Scotia.....	48	3.0	6.3	13	27
New Brunswick.....	33	2.1	5.3	9	27
Quebec.....	368	23.0	6.5	99	26
Ontario.....	695	43.5	10.3	165	24
Manitoba.....	87	5.4	9.1	15	17
Saskatchewan.....	72	4.5	7.6	15	21
Alberta.....	130	8.1	9.0	64	49
British Columbia.....	156	9.8	8.7	31	20
Territories.....	0	0	0.0	0	0
Total.....	1,598	100.0	8.2	415	26

A comparison of the ratios of psychologists to populations in Table 1 with U.S. data³ (see Table A-1, Appendix 4) reveals that most of the provinces are in the range characteristic of the Southern States principally (<8.9 psychologists per 100,000 population). The number of psychologists per 100,000 population in Ontario (10.3)—the most favorable ratio in Canada—is roughly equivalent

¹ The 1966 Directory of American Psychological Association lists 24,473 members. Officers of that Association (personal communication) have estimated, on the basis of comparisons of membership lists of state, regional and other psychological associations with that of the national body, that the number of active psychologists in the United States, is perhaps 35,000 or more. The figure 32,000 was taken as a reasonable minimum estimate.

² "Physics in Canada", *Bulletin of the Canadian Association of Physicists*, 1965, Vol. 21, No. 3.

³ The U.S. ratios are considerably underestimated since they are based on only the approximately 25,000 psychologists who are APA members and not the estimated 32,000 U.S. psychologists.

to the median of all the states, and well below that for neighboring New York State, which has a ratio in the range of 24.0 to 27.9 psychologists per 100,000 population.

Comparisons between provinces show clearly that certain provinces are in short supply relative to the number of psychologists elsewhere. Ontario has not only the largest absolute number of psychologists (43.5% of all Canadian psychologists) but also the largest per capita ratio (10.3 to 100,000). At the other extreme, Newfoundland, Prince Edward Island, and the Territories have no more than a handful of psychologists (9 in all) for a combined population of 646,000 people.

Estimates of the proportion of psychologists in each province in university settings are given in Table 1 for what light they may throw on the question of amount of psychological services (as opposed to educational services) available in each province. Excepting Newfoundland and Prince Edward Island, where the numbers are too small to be informative on this point, the proportion is quite similar in seven of the other provinces (17 to 27%). Only Alberta shows an unusual (49%) concentration of its psychologists in academic settings, implying that the ratio of non-academic psychologists per 100,000 population is less favorable in this province than its ratio of total psychologists to population would suggest.

In the course of analysis, it became evident that there is a disproportionate concentration of psychologists in the larger urban centers. Over half of the psychologists in Canada are located in the four major cities: Toronto, Montreal, Vancouver, and Ottawa, whereas the combined population of these cities is less than 30% of the Canadian total. University location is undoubtedly a key to this disparity, but it only reinforces the probability that such consultative and ancillary service functions as may be available from universities are available primarily in those centers where the density of psychologists is already heaviest.

1.4 Citizenship and Education

A significant fraction of the work force (19.7%) is non-Canadian; of these over half (11.3% of the total) are Americans (Table 2). The 8.4% of other non-Canadians come largely from Commonwealth countries (U.K.—38, India—17, Australia and New Zealand—10, South Africa—4), while 20 come from other European countries, 16 from other Asian countries, 3 from the Caribbean and 1 from the United Arab Republic.

There is a striking difference between foreign citizenship components of Canadian physicist¹ and psychologist populations. Approximately 18% of physicists are reported to be non-Canadian compared with 19.7% of psychologists. But only 7.5% of the non-Canadian physicists in Canada are U.S. citizens compared with 57.6% of the non-Canadian psychologists. (Further comment on this high proportion of U.S. citizens will be made in later sections of this study.)

Table 2 also reveals that approximately 40% of the respondents hold doctoral degrees, 46% hold master's degrees and 14% hold baccalaureates. Since a

¹ "Physics in Canada" (*op. cit.*)

Table 2.—Citizenship and Educational Attainment

Educational Attainment	Total		Country of Citizenship								Citizenship not reported
			Canadian		Non-Canadian		U.S.		Other Foreign		
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
Post-Doctorate Study.....	36	2.7	17	1.6	19	7.4	14	9.5	5	4.6	—
Doctorate.....	491	37.4	334	32.0	153	59.8	96	64.9	57	52.8	4
Total with Doctorate.....	(527)	(40.1)	(351)	(33.6)	(172)	(67.8)	(110)	(74.4)	(62)	(57.4)	(4)
Post-Master's Study.....	122	9.3	97	9.3	23	9.0	11	7.4	12	11.1	2
Master's Degree.....	481	36.6	426	40.8	50	19.5	23	15.5	27	25.0	5
Total with Master's Degree.....	(603)	(45.9)	(523)	(50.1)	(73)	(28.5)	(34)	(22.9)	(39)	(36.1)	(7)
Post-Graduate Study.....	73	5.6	65	6.2	6	2.3	3	2.0	3	2.8	2
Bachelor's Degree.....	110	8.4	105	10.1	5	2.0	1	0.7	4	3.7	0
Total with Bachelor's Degree.....	(183)	(14.0)	(170)	(16.3)	(11)	(4.3)	(4)	(2.7)	(7)	(6.5)	(2)
Education Not Reported.....	10		5		1		0		1		4
Total Reporting Education.....	1313	100%	1044	100%	256	100%	148	100%	108	100%	17
(N = 1306) Percentage of those reporting citizenship		100.0		80.3		19.7		11.3		8.4	

majority (60%) of the doctorates in Canada were earned in the present decade it can be assumed that the current 40% figure indicates a substantial improvement in the educational level of psychologists in Canada in recent years. However, comparison with available U.S. figures¹ (67%, 32%, and 1%, respectively) suggests a much lower educational attainment in the Canadian psychological community.

American psychologists when compared with other scientists in the U.S. appear to have a much higher proportion of doctorates (67% vs. 37% for U.S. scientists as a whole).² That Canadian psychologists may have a somewhat higher educational level relative to other scientists in Canada is suggested by comparing psychologists' educational attainments with those of physicists as recently reported,³ namely, 38% Ph.D.'s, 27% masters, 35% baccalaureates. Current and projected surveys of other scientific disciplines will reveal the generality of this comparison.

Canada's foreign psychologists contribute disproportionately to the doctorate group. Of the 527 psychologists reported holding the doctorate, 172 or 31.5% are of non-Canadian citizenship. Figure 1 illustrates the relative distribution of academic degrees among psychologists in Canada grouped by country of citizenship. The impact of recent immigration on the educational attainment of Canadian psychology since 1960 can be seen in Figure 2, for the great majority of immigrants (most of them with doctorates) have come to Canada in the present decade.

No data are available on either emigration of Canadian psychologists or on immigrants to Canada who subsequently left. Nor can the present findings be interpreted independently of information regarding the number of Canadian doctorates currently entering the profession. Nevertheless, there appears to be a substantial dependence on immigration—particularly from the U.S.—for doctoral personnel. There is an even greater dependence upon U.S. institutions for doctoral training since 27% of Canadian citizens completed their doctoral work there (Table 3). By contrast, only 10% of the U.S. citizens in Canadian psychology received their doctoral training in Canada. We do not know how many of those earning Canadian doctorates have found employment in other countries.

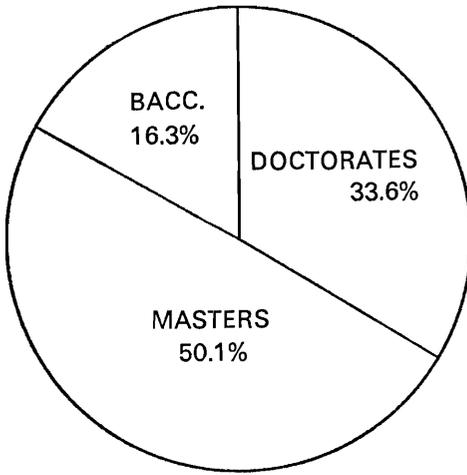
Table 3.—Country of Education of Canadian Citizens

Level of Education	Country of Education at Level Indicated									
	Canada		U.S.		U.K.		Other		Total	
	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage
Doctorate.....	277	61.8	122	27.2	31	6.9	18	4.0	448	100.0
Master's.....	824	87.9	99	10.6	6	0.6	8	0.9	937	100.0
Undergraduate.....	984	94.3	36	3.4	14	1.3	10	1.0	1,044	100.0

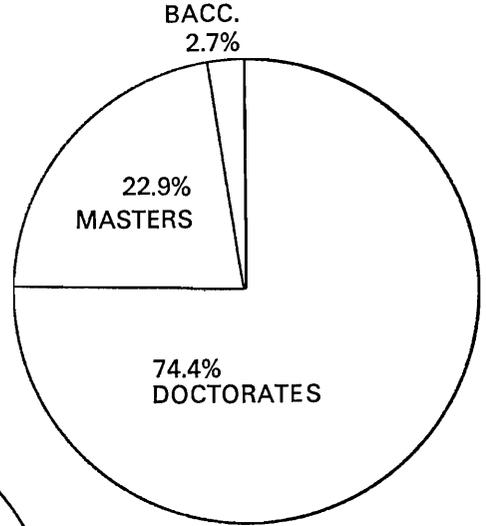
¹ 1966 National Register of Scientific and Technical Personnel

² National Science Foundation

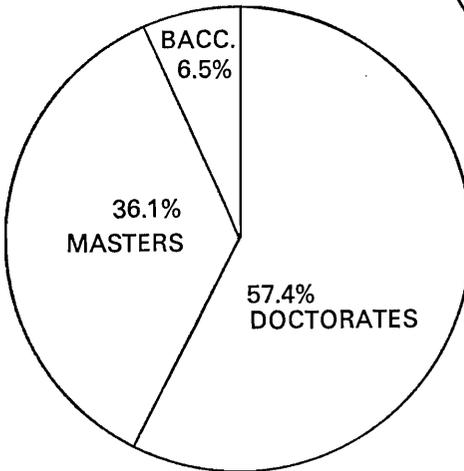
³ "Physics in Canada" (*op. cit.*)



CANADIAN CITIZENS



U.S. CITIZENS

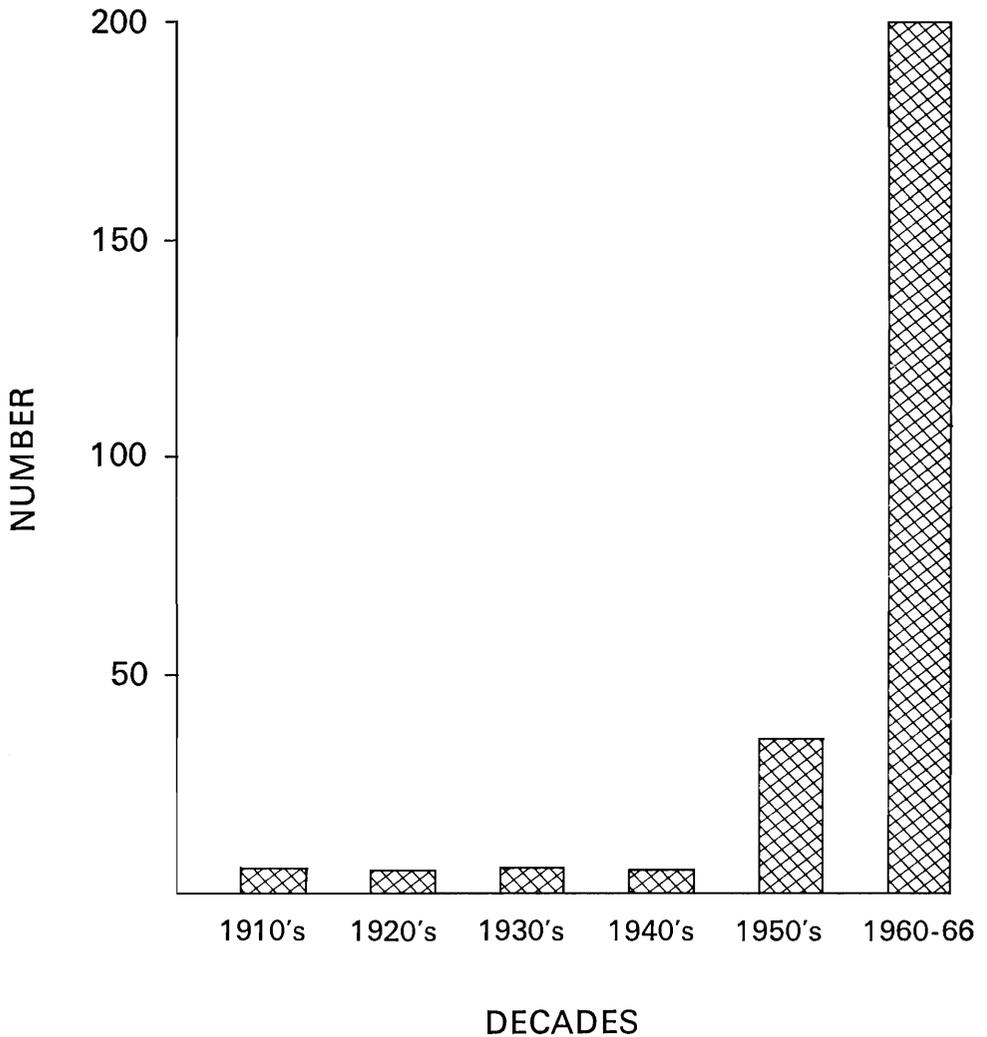


OTHER FOREIGN CITIZENS

**EDUCATIONAL ATTAINMENT OF
CANADIAN PSYCHOLOGISTS
BY CITIZENSHIP STATUS**

FIGURE 1

U.S.	0	1	2	1	16	112
OTHER	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>18</u>	<u>87</u>
TOTAL	1	2	2	2	34	199



DATE OF ENTRY TO CANADA OF
PSYCHOLOGISTS NOW IN CANADA
WHO ARE CITIZENS OF THE U.S.
OR OTHER FOREIGN COUNTRIES

FIGURE 2

Table 3 reveals further that whereas only 3.4% of Canadians studied in the U.S. at the undergraduate level, this proportion increases to 10.6% at the master's level and 27.2% at the doctoral level. An additional 6.9% received doctoral training in the U.K. and 4% elsewhere. Over one-third of Canadian citizens with doctoral level training, then, received this training outside of Canada. Additional data show that of all psychologists in Canada with training at the doctoral level 38.1% (247 of 649) received this training in the U.S., compared with 47.9% (311 of 649) trained in Canada and 14% (91 of 649) trained elsewhere.

Since there is every indication that the Canadian psychology community will continue to expand, this significant dependence on non-Canadian personnel and institutions should be a matter of serious concern. We do not know, of course, the proportions (and relative quality) of Canadian students who obtain doctorates in the U.S. and choose to remain there vs. those who return to Canada, the proportions (and quality) of foreign psychologists who come to Canada for doctoral study or employment and remain vs. returning to their own countries or moving on elsewhere, or the proportions of Canadian-trained psychologists who emigrate vs. remaining in the Canadian work force.

Two factors that are critical but difficult to assess are what may be called the "propensities to emigration" in the present work force and conversely the "drawing" or "holding" power of the Canadian psychological community. There is some indication that Canadians trained in the U.S. are more inclined to leave Canada than those without experience in that country. On the other side, only 10% of the American immigrants in the Canadian work force studied in Canada and thus could have been attracted here through this channel. If the 1966 doctoral graduates are typical (see section 3.2), it appears that a large proportion of Canadian *and* American doctorates from Canadian universities find employment in the United States.

One crude attempt to assess the "brain drain" and "counter brain drain" has been made. From our surveys we estimate that approximately 180 U.S. citizens are now working as psychologists in Canada. Sampling the 1966 Directory of the American Psychological Association provides an estimate of some 240 Canadians¹ employed in the U.S. On an absolute basis, then, despite the tenuous nature of the data, it seems reasonable to suppose that there are more Canadians "lost" to the U.S. than there are Americans "gained" by Canada.

1.5 Age

Table 4 gives the age distribution of all respondents in relation to educational attainment, and separately for those in academic settings and for those who are U.S. citizens. The median age for psychologists in Canada is just over 37, compared with 41 reported for those in the U.S.² The median age of 36 for U.S.

¹ Based on assumption that those with Canadian baccalaureate degrees are or were Canadian citizens. Of course, as earlier noted, APA membership represents only 80% of total U.S. psychologist population.

² 1966 National Register of Scientific and Technical Personnel.

citizens in the Canadian psychological community approximates the Canadian rather than the American median, suggesting as does the distribution of ages in this immigrant group, that they have tended to be attracted from the younger American professional community.

Academic psychologists (median age = 38) do not differ materially from the general Canadian psychologist population.

The preponderance of respondents are between 27 and 46 years of age. Within this range the proportions holding advanced degrees are approximately the same across age groups. Since the average age for earning the doctorate is over 30, it is not surprising that the number of doctorates in the youngest group is small.

Table 4.—Age Distribution by Educational Level, and Separately for Sub-groups of Academic Psychologists and American Immigrants

Age	Doc- toral degree	Mas- ter's degree	Bach- elor's degree	Educa- tional level not given	Total		Academic Psychologists		American Immigrants	
					Num- ber	Per- centage	Num- ber	Per- centage	Num- ber	Per- centage
Over 66.....	3	4	—	—	7	.5	1	.2	2	1.3
57-66.....	31	30	8	2	71	5.4	28	6.5	5	3.4
47-56.....	75	101	18	1	195	14.7	69	16.1	13	8.8
37-46.....	187	181	50	1	419	31.7	141	32.9	52	35.1
27-36.....	212	198	48	2	460	34.8	164	38.3	68	46.0
Under 27.....	17	88	59	3	167	12.6	25	5.8	8	5.4
Age not given....	2	1	0	1	4	.3	0	—	0	—
Total.....	527	603	183	10	1,323	100.0	428	100.0	148	100.0

Table 5 suggests that younger psychologists tend to both earn their degrees and enter professional life at a slightly earlier age than appears to have been the case for older psychologists. The interference of World War II with career plans of the 37 to 46 and 47 to 56 year old groups may however have distorted these findings.

Table 5.—Median Ages at Which Advanced Degrees Earned¹ and Profession Entered

Age group	Median Age Degree Earned		Median Age Entered Profession
	Master's	Doctorate	
57 or over.....	28.8	32.8	29.3
47-56.....	30.5	39.5	33.0
37-46.....	27.8	37.8	28.3
27-36.....	25.2	29.2	27.7
Under 27.....	25.3	—	25.8

¹Based on numbers of individuals in each age group as given in Table 4.

There appears to be no change in the length of time required to earn either master's or doctoral degrees (Table 6). The former required an average of 2.3 years and the latter 3.6 years.

Table 6.—Average Number of Years of Graduate Study Required to Earn Advanced Degrees

Year degree awarded	Number replying	Number of years for Master's	Number replying	Number of years for Doctorate
1945 or earlier.....	99	2.3	31	3.7
1946-1950.....	129	2.2	23	3.0
1951-1955.....	177	2.4	64	3.7
1956-1960.....	245	2.2	108	3.5
1961-1965.....	376	2.3	238	3.6
Overall	1,026	2.3	464	3.6

1.6 Principal Work Functions

Table 7 gives the distribution of respondents by principal work function¹. Functions have been grouped into those clustered around "service" activities on the one hand (52.6%) and "teaching and research" on the other (35%). Administrative functions associated with either cluster have been included with it, leaving a miscellaneous third group, made up of general administrators (3.3%), and others whose responses were insufficient to permit proper classification (7.7%), or whose principal functions were not primarily psychological (1.4%).

Although more than half the active psychologists in Canada are engaged in functions directly related to the provision of psychological services, only a third of these (14.3% of total) indicate the direct practice of counselling or psychotherapy as their principal function. Approximately equal proportions have supervisory and/or administrative functions (16.1% of total) or engage in testing as a principal function (16.3%). Relatively small numbers have primarily consulting functions (2.6%) or are involved in training and personnel development (2.8%).

Just under one in five psychologists in Canada lists teaching as a principal function, though the number who engage in teaching as at least a secondary function is considerably higher. It may be assumed that the 11% reporting research as a principal function represent only a small fraction of those engaged in research activities. Actually very few psychologists fail to list research as an activity in which they engage for at least a part of their work functions.

¹"Principal Work Function" is that function to which respondents indicate the greatest single portion of their time is devoted. It is not necessarily the function which occupies more than half of their time, because, in addition to principal function, any number of functions may be indicated, so long as each occupies at least $\frac{1}{2}$ day per week. Further, principal work function may not necessarily be the function for which the individual is ostensibly employed—for example, a person employed as a "clinical psychologist" might spend more of his time in administrative or testing functions than in actual clinical practice. Analysis of the population in terms of position title or primary self-identification (see Section 1.8) shows, for example, a much larger portion of clinical psychologists than seems to be indicated in Table 7. Conversely, considerably fewer persons carry the title of research psychologist than are engaged in that function.

Table 7.—Principal Work Functions of Psychologists

Principal Function	Total Number	Percentage of work force
Administration (Service Settings) ¹	113	8.5
Clinical Practice or Psychotherapy.....	105	7.9
Counselling Practice.....	84	6.4
Other Consulting.....	35	2.6
Computer Service or Statistical Processing.....	7	0.5
Test Administration or Interpretation.....	215	16.3
Training and Development of Personnel (including Executive).....	37	2.8
Others in Service Settings ²	100	7.6
SUBTOTAL (Service).....	696	52.6
Administration (Academic or Research Setting) ¹	33	2.5
Research.....	148	11.2
Teaching—Psychology.....	201	15.2
Teaching—Other.....	35	2.6
Technical or Professional Writing.....	8	0.6
Others in Academic or Research Settings ²	38	2.9
SUBTOTAL (Academic or Research).....	463	35.0
General Administration ¹	44	3.3
Other.....	18	1.4
No Response.....	102	7.7
SUBTOTAL (Other).....	164	12.4
Total.....	1,323	100.0

¹Including committees

²Information supplied by respondents was sufficient to identify setting but not specific principal work function.

Approximately 15% of the total work force engage in some form of supervisory or administrative activities as their *principal* work function. Although all professions require some administrative time, some of the time spent in this manner by psychologists is inherent in the psychological service function (e.g., clinical supervision) and should be kept in mind in any future manpower projections regarding psychological service personnel.

1.7 Sex and Work Function

Of the 1,323 respondents, 919 or 69.5% are men, and 404 or 30.5% are women. Table 8 gives the distribution of psychologists across principal work functions separately for men and for women and shows the relative contribution of each sex to the several functions.

Appreciably more male than female psychologists are in administration, research, and the teaching of psychology, whereas women show a significant clustering in the testing function. A greater proportion of women than of men are engaged principally in clinical practice. In terms of the general functional

Table 8.—Principal Work Functions and Sex

Principal Function	Total	Males	Females	Percentage in each P.F.		Percentage in P.F. who are	
				Males	Females	Males	Females
Clinical.....	105	57	48	6.2	11.9	54.3	45.7
Counselling.....	84	64	20	7.0	5.0	76.2	23.8
Consulting.....	35	28	7	3.0	1.7	80.0	20.0
Computer/Statistics.....	7	6	1	.6	.2	85.7	14.3
Testing.....	215	102	113	11.1	28.0	47.4	52.6
Personnel.....	37	33	4	3.6	1.0	89.2	10.8
Research.....	148	114	34	12.4	8.4	77.0	23.0
Teaching—Psychology..	201	166	35	18.1	8.7	82.6	17.4
Teaching—Other.....	35	23	12	2.5	3.0	65.7	34.3
Writing.....	8	7	1	.8	.2	87.5	12.5
Administration ¹	190	152	38	16.5	9.4	80.0	20.0
Other ¹	26	17	9	1.9	2.2	65.4	34.6
No Response ¹	232	150	82	16.3	20.3	—	—
Total.....	1,323	919	404	100.0	100.0	69.5	30.5

¹No attempt was made here or in successive sections to redistribute these groups among “service” “teaching-research” and “other” groupings as was done in Table 7 and related earlier discussions for purposes of general description. Of those able to be reclassified on the basis of other information approximately half could be expected to be in service settings, one quarter in academic and research settings and one quarter in other or unknown categories.

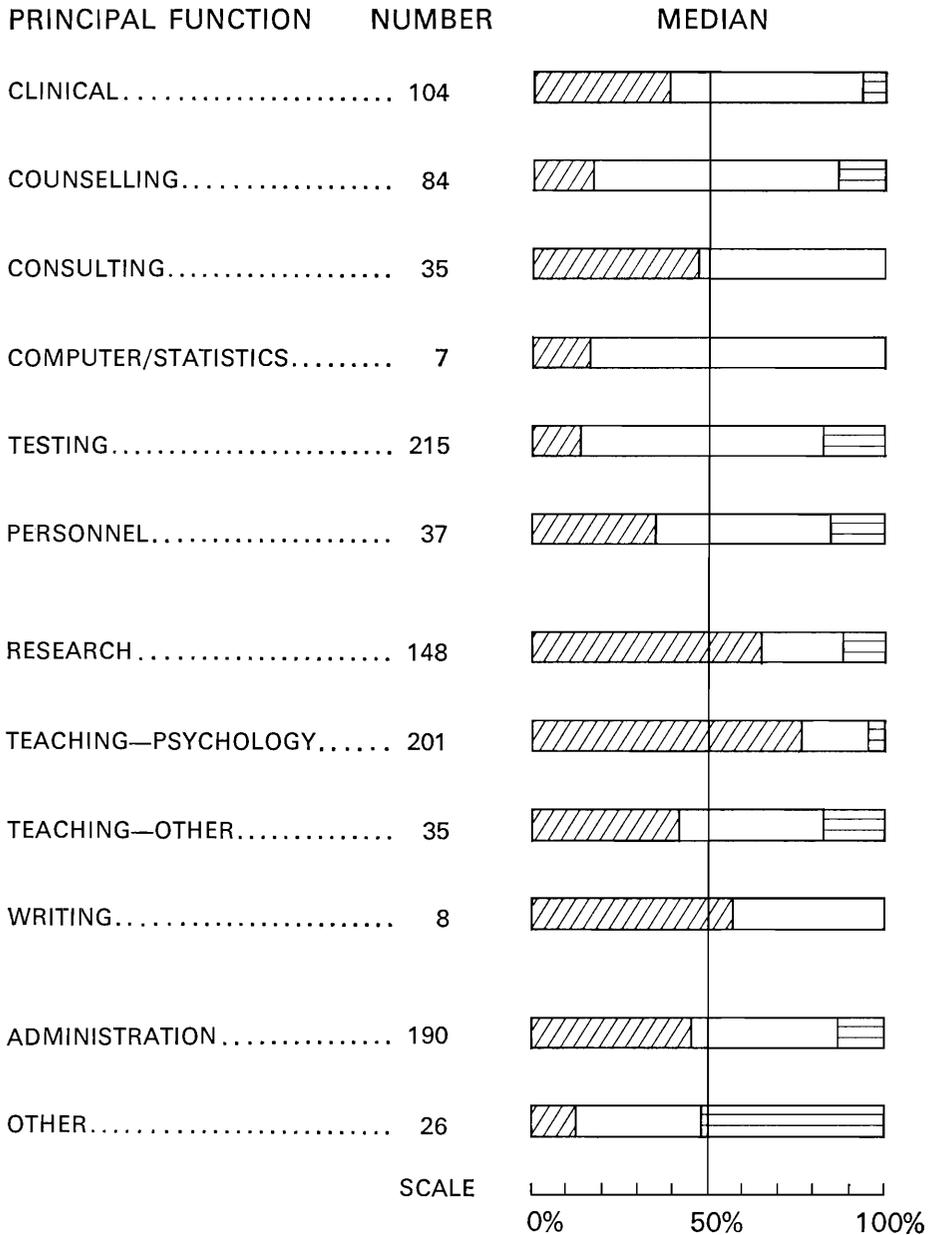
dichotomy, approximately half the women are in the “service” section, vs. only a third of the men; whereas a third of the men are in “teaching and research”, vs. only a fifth of the women.

Data on educational attainment and income in relation to sex and to principal work function presented in the sections that follow throw light on these discrepancies. For instance, women tend to be in those occupations for which a master’s degree (as opposed to a doctorate) is normal and for which income is lower.

Men are represented disproportionately in the following areas: counselling practice, other consulting, computer service or statistical processing, training and development of personnel, research, teaching of psychology, technical or professional writing, and administration. Conversely, women are disproportionately represented in clinical practice and testing. (The previously noted coincidence of lower acceptable degree levels and income may account for the higher incidence of women in these areas, although culturally determined expectations and preferences cannot be disregarded.)

1.8 Educational Attainment and Work Function

Figure 3 represents the proportion of each work function occupied by persons at doctoral, master’s, and bachelor’s degree levels.



PROPORTIONS OF THOSE IN EACH PRINCIPAL WORK FUNCTION AT DOCTORAL MASTER'S AND BACHELOR'S DEGREE LEVELS

FIGURE 3

Only for those engaged in research and in the teaching of psychology (and the small group who do professional writing as a principal activity) does the median educational attainment reach the doctoral level. Administrators, consultants, and teachers (other than psychology) have 40% or more doctorates; for all the "service" activities the master's degree is the median educational level.

More than half the doctorates are engaged in research, teaching, or writing; only one fifth of the doctorates are in service functions. On the other hand, half of those with master's level training indicate service activities as their principal function, with less than an eighth in research, teaching, or writing.

It was earlier noted (Section 1.4) that educational attainment of psychologists in the United States is somewhat higher than in Canada. Hence the proportions of doctorates in most of the functional categories is higher in the U.S.¹ than in Canada. The only exception is in the proportion identifying research as their principal work function (56% with doctorates in U.S. (1964 figures) as compared with our finding for 1966 of 65% in Canada).

The sharpest contrast between distributions of U.S. and Canadian doctorates is found in the clinical and counselling functions. In 1964, 60% of U.S. psychologists in these categories held doctorates compared with only 27% of Canadian psychologists in 1966. If one accepts level of training as an index of strength of an area these findings suggest a serious weakness in two areas of considerable public concern in Canada.

1.9 Age and Work Function

Figure 4 illustrates the distribution of those over and under 36 years of age in the principal work functions. As previously noted, the work force is approximately equally divided into those above and below this age (Table 4). Disproportionate distributions are seen in testing and research, where younger persons predominate, and in administration where, as might be expected, there is a higher proportion of persons over 36.

Inasmuch as working under supervision is a normal procedure in the testing function, the relative youth of the group found there is not unusual. The higher proportion of younger persons naming research as their principal function may, however, have several interpretations. First, it may suggest that these younger persons are relatively junior and are thus in subordinate positions. But since a high proportion of those in research hold doctorates, a second and perhaps more likely explanation is that such younger persons are relatively free from accrued responsibilities that might divert them from primary occupation with research, and so engage in it in larger number. Thirdly, it is possible that the high proportion of younger people here may indicate a general predilection among newer psychologists for research.

Analysis of the proportions in each age group in the various principal functions reveals that testing occupies nearly a third of the under-27 age group, and testing, research, and teaching of psychology together account for over half of the

¹ Compton, B. E., Psychology's manpower: Characteristics, employment, and earnings. *American Psychologist*, Vol. 21, No. 3, March 1966. [Based upon returns to the 1964 National Register of Scientific and Technical Personnel]

Table 9.—Age and Principal Function

Principal Function	Age							Percentage in Each P. F. Above and Below Age of 36		Percentage of Each Age Group in Principal Function				
	Over 66	57-66	47-56	37-46	27-36	Under 27	Age not given	Percentage in Each P. F. Above and Below Age of 36		57+	47-56	37-46	27-36	Under 27
								36+	36-					
Clinical.....	1	5	15	32	43	9	—	50.5	49.5	7.7	7.7	7.6	9.3	5.4
Counselling.....	2	4	9	36	24	9	—	60.7	39.3	7.7	4.6	8.6	5.2	5.4
Consulting.....	—	—	8	10	14	3	—	51.4	48.6	—	4.1	2.4	3.0	1.8
Computer /Statistics.....	—	—	—	4	3	—	0	57.1	42.9	—	—	1.0	0.7	—
Testing.....	—	9	22	46	87	51	—	35.8	64.2	11.5	11.3	11.0	18.9	30.6
Personnel.....	—	2	7	11	13	4	—	54.1	45.9	2.6	3.6	2.6	2.8	2.4
Research.....	1	7	14	32	71	21	2	37.0	63.0	10.3	7.2	7.6	15.4	12.6
Teaching—Psychology..	—	11	29	67	83	11	—	53.2	46.8	14.1	14.9	16.0	18.0	6.6
Teaching—Other.....	—	5	7	10	9	4	—	62.9	37.1	6.4	3.6	2.4	2.0	2.4
Writing.....	—	—	—	5	2	1	—	62.5	37.5	—	—	1.2	0.4	0.6
Administration.....	—	16	48	75	42	8	1	73.5	26.5	20.5	24.6	17.9	9.1	4.8
Other.....	1	—	—	7	10	8	—	30.8	69.2	1.3	—	1.7	2.2	4.8
No Response.....	2	12	36	84	59	38	1	58.0	42.0	17.9	18.5	20.0	12.8	22.8
Total.....	7	71	195	419	460	167	4	52.3	47.7	100.0	100.0	100.0	100.0	100.0

27 to 36 age group. Administration occupies a higher proportion (about 20% to 25%) in each of the 37 to 46, 47 to 56, and 57 and over age groups, while the three principal functions of administration, testing, and teaching of psychology occupy roughly half of each of these groups over 36. Research as a primary function again occupies over a tenth in the over 56 group.

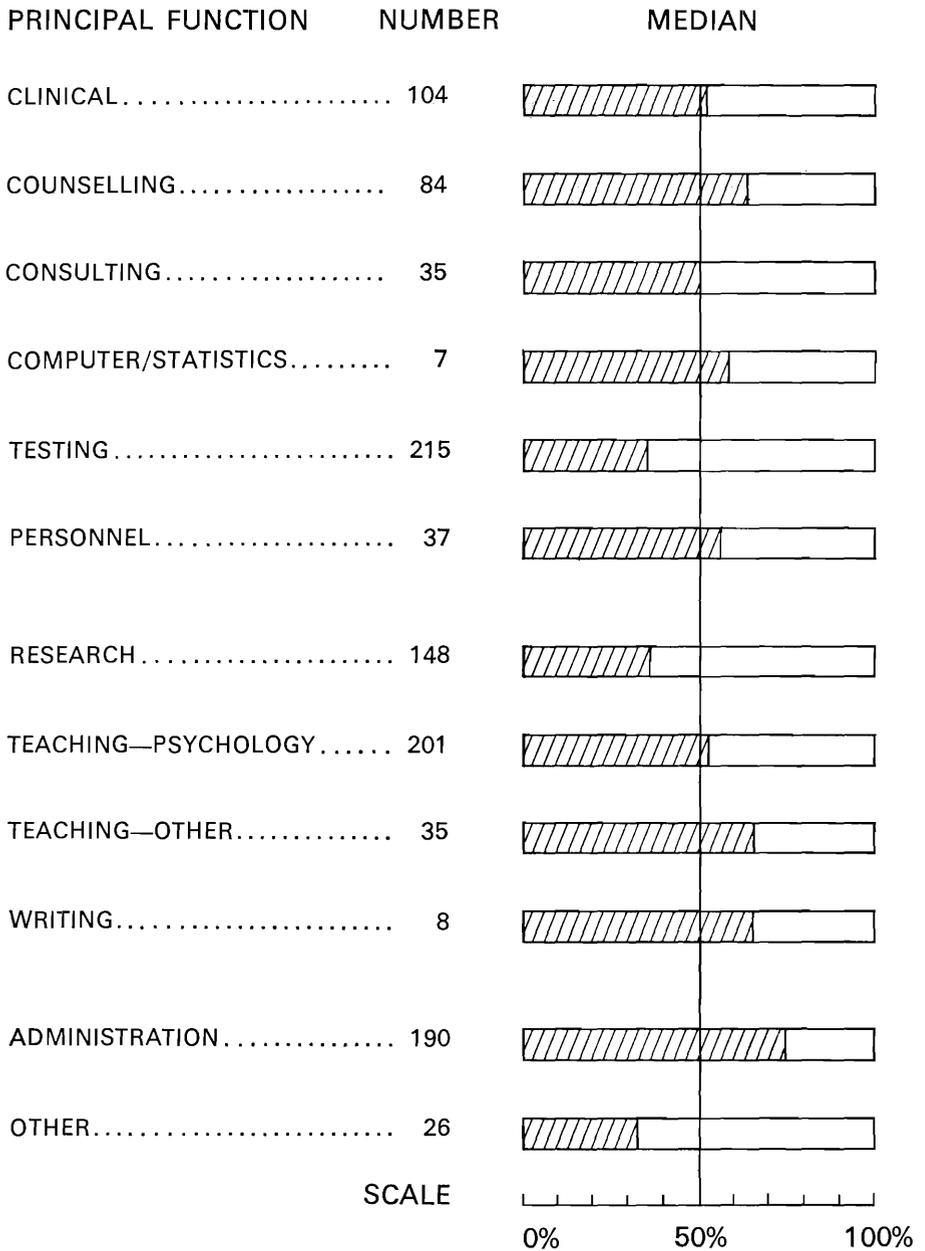
1.10 Income and Work Function

Table 10 shows median incomes, from principal employment only, for persons in each functional category, based upon a total of 1,088 respondents who reported their income.

The highest median incomes are in personnel (\$11,600), administration (\$11,100), teaching of psychology (\$10,400), and consulting (\$10,010), in that order. The highest incomes from principal employment reported were in personnel and consulting (\$40,000 and \$30,000, respectively). The lowest median income (\$7,725) is in testing, for which the lowest income also was reported (\$4,000).

The testing function may be at the bottom of the income scale largely because it is also low on the educational attainment scale and has the largest proportion of persons under 36, including nearly a third of the “under 27” group. (Figures 3 and 4). Also it is a function often carried out under supervision.

Neither degree status nor age appear relevant to the favorable incomes in personnel and consulting. The likely explanation is that professional service is more highly rewarded in business and industrial settings than in the less financially



PROPORTIONS OF THOSE IN EACH WORK
 FUNCTION OVER 36 YEARS OF AGE 
 AND 36 OR UNDER 

Table 10.—Principal Function and Income from Principal Employment

Principal Function	Number reporting income	Median income	Range of incomes reported
Clinical.....	83	\$ 8,500	\$4,700–\$20,000
Counselling.....	77	8,500	4,900– 16,300
Consulting.....	30	10,010	6,000– 30,000
Computer/Statistics.....	6	9,250	6,800– 18,000
Testing.....	187	7,725	4,000– 20,000
Personnel.....	31	11,600	6,000– 40,000
Research.....	140	9,450	4,800– 23,500
Teaching—Psychology.....	176	10,400	4,000– 22,000
Teaching—Other.....	32	9,600	4,100– 15,825
Writing.....	8	9,850	5,880– 18,750
Administration.....	177	11,100	4,850– 24,000
Other.....	21	8,100	4,600– 16,000
Unclassified.....	120	9,600	4,000– 20,000
Overall.....	1,088	\$ 9,235	\$4,000–\$40,000

independent and largely government-related service and educational institutions. The relatively higher median income for administration may be more closely related to age and length of service.

Teaching of psychology may be high on the income scale because this category contains the largest proportion of doctorates. The situation may also reflect a deliberate response to the competition with U.S. institutions in the recruitment of qualified university faculty in a period of rapid expansion and short supply in both countries.

Overall median income was \$9,235, whereas the comparable figure for the U.S. is \$11,500.¹ At the doctoral level the comparable figures are \$11,600 and \$12,000² for Canadian and American groups, respectively, a considerably lesser differential.

The largest discrepancy between Canadian and American psychologists is found for the clinical and counselling functions. The Canadian median of \$8,500 is considerably below the almost \$12,000 earned in the United States where the higher educational attainment of persons in these functions has already been noted (Section 1.8). Be it symptom or partial explanation, the low median income in Canada for these functions seems another indication that there is a problem about these services in this country.

Sex may be a further factor accounting in part for the relatively low incomes in testing and clinical practice. These two categories account for almost 40% of the women in the work force (Table 8). It cannot be concluded, how-

¹ 1966 National Register of Scientific & Technical Personnel (U.S.)

² 1966 National Register of Scientific & Technical Personnel

ever, that sex is the determining factor here, since women are *under-represented* in the counselling function, which has a median income as low as that in the clinical area.

There is an appreciable difference in median incomes at the different educational levels, yet women tend to earn less than men at each level (Table 11).

Table 11.—Educational Level and Sex in relation to Income from Principal Employment

Educational Level	Males	Median income	Females	Median income	Combined	Median income
Doctoral Degree.....	424	\$12,000	103	\$10,000	527	\$11,600
Post Master's Study.....	98	11,000	23	8,000	121	10,430
Master's Degree.....	285	8,800	194	7,200	479	8,150
Postgraduate Study.....	50	8,000	25	6,900	75	7,600
Bachelor's Degree.....	58	7,800	56	5,900	114	6,870
No response.....	4	—	3	—	7	—
Overall.....	919	\$10,410	404	\$ 7,760	1,323	\$ 9,235

The data here reported are, as previously mentioned, for income from principal employment only. This account should therefore be supplemented by the information presented in the next section.

1.11 Income from Secondary Employment

Table 12 gives data on extra employment reported by respondents. Distinction is made between regular and occasional (or casual) "overtime" employment. Over one sixth of fulltime employed psychologists reported having regular additional commitments, 40% in service activities and 30% teaching psychology.

An average of \$1,220 is earned from additional regular employment, although this is considerably higher (\$2,500) for those whose regular outside activities consist of clinical or counselling practice.

It is difficult to estimate time spent in regular additional employment because the pattern is so varied. Nevertheless those who do engage in regular outside work appear to spend approximately ten hours per week in such endeavors for an average of nine months per year. This suggests that the full-time equivalent of between 50 and 70 persons are added to the work force through such overtime employment.

In addition to *regular* secondary employment, some 14% of the respondents reported *occasional* (or casual) secondary work from which they derive an average of between \$500 and \$1,500 additional annual income. Again, teaching of psychology is a function in which a large number of psychologists (38) engage, although the combined service functions account for over 50% of the occasional employment in which they are involved.

Table 12.—Numbers of Employed Psychologists Reporting Secondary (Additional) Employment and Median Additional Income from Secondary Employment (Secondary Employment Categories of Academic Psychologists are shown in Parentheses.)

Secondary Function	Regular Secondary Employment			Occasional Secondary Employment		
	Total number so engaged	Number of academic psychologists engaged	Median additional income	Total number so engaged	Number of academic psychologists engaged	Median additional income
Clinical.....	27	(7)	\$2,500	20	(7)	\$ 600
Counselling.....	19	(8)	2,500	22	(11)	750
Consulting.....	14	(7)	2,000	8	(5)	1,200
Computer/Statistics.....	1	(0)	700	0	(0)	—
Testing.....	28	(6)	1,800	41	(6)	840
Personnel.....	10	(3)	1,200	8	(4)	880
Research.....	24	(16)	2,000	12	(7)	1,500
Teaching—Psychology.....	70	(22)	1,200	38	(13)	600
Teaching—Other.....	5	(1)	1,300	15	(1)	500
Writing.....	7	(4)	1,000	8	(4)	1,200
Administration.....	19	(3)	1,150	6	(4)	900
Other.....	8	(3)	1,000	10	(5)	600
Total.....	232	(80)	\$1,220	189	(67)	\$ 672

Percentage of Work Force 17.5 14.3
 Percentage of Academic Psychologists (19.8 %) (16.6%)

Separate information is presented for outside employment of university-based psychologists (see parenthetic columns in Table 12) because of the heavy concentration of research psychologists in these settings (see Sections 2 and 3). Although the model overload activity of academic psychologists is teaching, their outside activities are by no means confined to this function. Conversely, a much larger portion of extra-duty teaching is done by non-university-based psychologists than by those in academic settings.

Data for the distribution of overtime functions of academic psychologists indicate that one in five holds a regular secondary position, while one in six participates in some form of occasional “outside” work. Many of the academic psychologists teach in summer or extension programs in their own or neighboring institutions, for which they receive additional compensation, and some of their added regular earnings comes from supported research. But a significant number also provide direct psychological services (either on a regular or occasional basis), further suggesting that a demand for such services exists.

1.12 Principal Work Function in Relation to Additional Functions

Most psychologists engage in more than a single work function as part of their regular employment (Section 1.6). Fewer than 15% of psychologists devote

full time to one function, the remainder engage in an average of three or more types of activities for significant portions of their regular employment time. Table 13 shows the distribution of these additional work activities in relation to identified principal categories. Inspection of this table provides a clearer functional characterization of psychological occupations than could be obtained from data on principal functions alone.

Table 13.—Other Functions Performed as Part of Regular Employment by Respondents in Each Principal Category

Principal Function	Total number reporting	Number reporting no additional functions	Numbers Reporting Additional Function as:											
			Clinical	Counselling	Consulting	Computer/Statistics	Testing	Personnel	Research	Teaching—Psychology	Teaching—Other	Writing	Administration	Other
			Clinical.....	105	10	—	24	17	1	74	21	20	20	2
Counselling.....	84	7	18	—	24	3	43	12	7	14	11	4	29	0
Consulting.....	35	0	9	6	—	1	20	15	6	6	4	3	15	1
Computer/Statistics.....	7	0	0	0	1	—	4	4	3	1	0	2	3	0
Testing.....	215	33	166	71	40	2	—	35	37	29	5	14	60	6
Personnel.....	37	4	9	10	5	1	6	—	5	3	1	3	20	2
Research.....	148	28	9	5	13	17	14	16	—	64	7	46	62	5
Teaching—Psychology.....	201	27	17	22	20	6	15	11	128	—	9	42	98	4
Teaching—Other.....	35	9	3	7	4	8	5	1	2	5	—	3	17	2
Writing.....	8	1	2	1	0	1	2	0	4	3	0	—	3	1
Administration.....	190	13	35	42	48	9	37	76	45	49	6	28	—	9
Other.....	26	14	2	1	4	0	4	2	2	1	0	4	7	—
Total Reporting.....	1,091	146	270	189	176	149	224	193	259	195	45	156	352	33

Clinical and testing functions and counselling and testing functions, are obviously paired in many positions. Almost three quarters of those principally engaged in clinical practice, and over half of those principally in counselling, spend an appreciable amount of their time in the construction, administration and/or interpretation of tests. Of those principally engaged in testing, over half also engage in clinical practice and one third in counselling practice.

In general there appears to be a clustering among the service functions, those engaged in one service activity tend to engage in one or more additional service-type functions. Similarly, there is considerable reciprocal relation between research and the teaching of psychology. However, sizeable proportions of clinical and testing personnel engage in teaching and research as part of their regular duties as well.

Those identified primarily as administrators almost without exception engage heavily in both service and teaching and research activities. Complementing this finding is the fact that a fairly high proportion of all other groups are involved with administrative activities. As a crude index of such responsibility one may note that administration accounts for fully one eighth of all (principal and other) functions named. Testing, research, and teaching of psychology each account for approximately 10% of all functions named. Clinical practice accounts for perhaps 8% of the total identified activities.

Approximately 50% of all psychologists identified administrative functions as one of their significant activities. Testing (40%), research (37%), teaching of psychology (36%) and clinical practice (34%) each occupied a third or more of all psychologists for at least part of their regular employment time. The remaining functions are performed by one quarter of psychologists or fewer (Table 14).

Table 14.—Proportions of Psychologists Engaged in Different Work Functions as Part of Their Regular Employment

Function	Approximate proportion engaged
Administration.....	.50
Testing.....	.40
Research.....	.37
Teaching (Psychology).....	.36
Clinical practice.....	.34
Counselling practice.....	.25
Personnel work.....	.21
Consulting.....	.20
Writing.....	.15
Teaching (Other).....	.07
Computer/Statistics.....	.05
Other.....	.05

Grouping service activities as opposed to teaching and research, but avoiding duplication, approximately the same ratios obtained as when principal function, alone, was considered (.41 vs .32 as compared with .44 vs .36). A considerable increase in the proportion of total functions occupied by administrative duties may be noted (from .174 to .237) when additional functions are examined along with principal activity.

In earlier comparisons of service vs teaching-research functions (Section 1.6) we identified administrators in service settings, yielding a higher percentage of psychologists in service areas (52.6%) than here indicated. If the same treatment were applied to the present analysis an overall ratio of approximately 3:2 might be said to obtain between service and teaching-research activities. This ratio appears to be as valid when total functions are considered as when principal functions are taken alone.

In the U.S., in contrast, approximately 49% of psychologists name either teaching or research as their principal activity vs only 31% for service functions.¹ [This difference is presumably a function of the disproportionately large educational and research establishments in the States and should not be interpreted as meaning that a larger service need (in relation to population) is being met in Canada.]

1.13 Principal Work Functions of English- and French-Speaking Canadians and of Non-Canadians in Work Force

Table 15 shows the numbers and proportions of English- and French-speaking² Canadians and of U.S. and other foreign respondents in each of the principal work functions. It is estimated that 13-14% of Canadian psychologists are French speaking.³ Unfortunately, the response rate for this group was so low (approximately 56.2%)⁴ as to make generalizations about their distribution in the different work functions questionable.

Nevertheless, taking the 9% French-Canadian fraction of those reporting as an average, there would appear to be a disproportionate contribution to the counselling function (17.1%) and an under-representation in research and in administration (4.1% and 4.8%, respectively).

The most significant conclusion to be drawn from Table 15 is the disproportionately heavy foreign, and especially American, representation in the research and teaching functions. Almost a third of the 347 psychologists naming research or teaching as their principal function are foreign, and of these 109, 72 are U.S. citizens.

There is a high degree of dependence in these crucial areas of research and teaching of psychology upon American and other foreign citizens. This is paralleled by the fact that persons in these functions most likely have received their doctoral level training in foreign countries, especially the U.S. Less than half (47.9%) of Canada's doctoral psychologists took their training at this level in Canada (Section 1.6). That figure drops to 36.2% and 39.3%, respectively, for those giving research and teaching as their principal work functions. Approximately half of these groups were trained in the United States.

In contrast with their heavy concentration in research and teaching, non-Canadians appear to be under-represented in counselling and consulting functions, and in administration. Selective recruiting may account for the uneven distribution of the immigrant groups among the work functions.

¹ 1966 National Register of Scientific and Technical Personnel

² French-speaking Canadians were identified by their request for or return of the French-language version of the Questionnaire. Further identification and response rates were affirmed through follow-up telephone contacts with non-respondents (see Appendix 3).

³ But see discussion by Dr. Belanger p. 127.

⁴ This response rate of 56.2% for French-Canadians was considerably below that of other respondents (almost 88% for English-speaking Canadians and approximately 83% for foreign citizens). Response rate for French-Canadians in Quebec was only about 58% compared with approximately 77% for English-speaking Quebec psychologists. Both were considerably below the overall response rate for the Survey.

Table 15.—Principal Functions of English- and French-Speaking Canadians and of Non-Canadians

Principal Function	English-Canadian		French-Canadian		Total Canadian		Total Non-Canadian		U.S. Citizens		Other Non-Canadian		Total Reporting Citizenship	
	Number	Per-centage	Number	Per-centage	Number	Per-centage	Number	Per-centage	Number	Per-centage	Number	Per-centage	Number	Per-centage
Clinical.....	72	69.9	12	11.7	84	81.6	19	18.4	8	7.8	11	10.6	103	100.0
Counselling.....	60	73.2	14	17.1	74	90.3	8	9.7	7	8.5	1	2.2	82	100.0
Consulting.....	27	79.4	3	8.8	30	88.2	4	11.8	3	8.8	1	3.0	34	100.0
Computer/Statistics.....	5	71.4	1	14.3	6	85.7	1	14.3	0	0.0	1	14.3	7	100.0
Testing.....	162	76.4	21	9.9	183	86.3	29	13.7	10	4.7	19	9.0	212	100.0
Personnel.....	23	63.9	3	8.3	26	72.2	10	27.8	7	19.4	3	8.4	36	100.0
Research.....	94	63.9	6	4.1	100	68.0	47	32.0	32	21.8	15	10.2	147	100.0
Teaching—Psychology.....	122	61.0	16	8.0	138	69.0	62	31.0	40	20.0	22	11.0	200	100.0
Teaching—Other.....	26	74.3	3	8.6	29	82.9	6	17.1	4	11.4	2	5.7	35	100.0
Writing.....	4	50.0	0	0.0	4	50.0	4	50.0	1	12.5	3	37.5	8	100.0
Administration.....	160	85.1	9	4.8	169	89.9	19	10.1	8	4.8	11	5.8	188	100.0
Other.....	24	92.3	2	7.7	26	100.0	0	0.0	0	0.0	0	0.0	26	100.0
P.F. not given.....	152	66.7	28	12.3	180	79.0	48	21.0	28	12.3	20	8.7	228	100.0
Total Reporting Citizenship...	931		118		1,049		257		148		109		1,306	
Percentage of those Reporting		71.3		9.0		80.3		19.7		11.3		8.4		100.0
Est. Total Psychologists.....	1,075		215		1,290		310		180		130		1,600	
Percentage of Total Psychologists.....		67.2		13.4		80.6		19.4		11.3		8.1		100.0

1.14 Fields of Work and Types of Employing Institutions

Analysis of the data in Table 16 related to field of specialty or occupational category¹ and type of employing institution leads to the conclusion that the proportions of psychologists in service, research and teaching and administration and miscellaneous, compare closely to those obtained from an earlier analysis of work functions. Approximately half of the psychologist population are in service-related positions, roughly one third identified with teaching and research, and the remaining sixth or less in administration and other activities.

When we turn to a comparison of fields of specialty as between Canadian and closest available U.S. figures² there appear to be no significant differences in the distributions of psychologists generally. However, when doctoral psychologists alone are compared, a number of striking differences are noted. First, there is a smaller proportion of doctorates in Canada generally, as previously indicated. Second, the proportions of doctorates in the areas of clinical and counselling psychology are markedly lower in Canada than in the U.S. (39% vs 61% and 36% vs 54% respectively). Educational and industrial psychology also have considerably lower proportions of doctorates in Canada than they do in the U.S. (34% vs 63% and 16% vs 50%, respectively).

With the exception of the biomedical specialty, which contains only five persons, *all* the fields in which even 40% of Canadian psychological personnel hold doctorates, are university based (Table 16). The highest proportion of doctorates in Canada is in the field of experimental psychology³, where the comparison with 1964 American figures is not unfavorable (82% vs 79%). Since the overall proportion of doctorates in Canada is so much below that of the U.S., this particular parity in university-based experimental psychology⁴ is especially noteworthy. Two factors probably are mainly responsible: highly selective recruiting, and the correlated recent increase of immigrant psychologists of doctoral level, particularly from the U.S. An additional contributing factor (see later sections) may well be the relatively better support for research in experimental psychology than is accorded to other significant areas in Canada.⁵

There is an apparent discrepancy between the proportions of those previously identified as clinical psychologists by virtue of work function and the much higher percentage (33%) identifying themselves in this way in Table 16. Examination of secondary functions showed a large overlap among the service areas and especially between clinical practice and testing. Many who consider themselves to

¹ The invitation to respondents (see Appendix 1, Question 18), to characterize their positions by *either* naming a sub-field from a Major Areas list *or* giving a more descriptive title has resulted in a more accurate but less homogeneous list of occupational categories than would be desired. Nevertheless, the resulting list (Table 16) is clear enough in its main categories to permit certain general observations and is more detailed than the work function lists so far described.

² U.S. data based on 1964 findings as reported in Compton, B.E., *op. cit.*

³ plus all three persons in the university-based statistics specialty.

⁴ Although favorable in the proportion of doctorates as compared with other Canadian specialty groups (excepting experimental psychology), the other academically based areas of developmental, personality, and social psychology fall considerably below parity with their American counterparts (development—61% vs 75%; personality—67% vs 77%; social—58% vs 82%).

⁵ The relative difficulty of obtaining support for research in academically based developmental, personality and social psychology, for example, as compared with experimental (including comparative and physiological) psychology may be of relevance to the difference in parity with the U.S. of doctoral proportions in these university-centred fields.

Table 16.—Fields of Work and Types of Employing Institutions

(Numbers in parentheses represent those with doctoral degrees)

Field or Category Reported	Number	Percentage of Total	Type of Employing Institution						
			Health & Welfare	Res. inst.	Govt.	School	Bus. or ind.	University	
								Total univ.	Psych. dept.
Clinical Psych.....	409 (159)	33.0 (38.9)	273 (99)	19 (7)	36 (10)	39 (6)	2 (1)	40 (36)	35 (32)
Counselling Psych.....	95 (34)	7.7 (35.8)	19 (8)	4 (2)	3	42 (15)	2 (1)	25 (8)	12 (6)
Developmental Psych.....	36 (22)	2.9 (61.1)	3	1	—	1 (1)	—	31 (22)	19 (16)
Educational Psych.....	50 (17)	4.0 (34.0)	4	1	3	23 (4)	—	19 (13)	3 (3)
School.....	63 (12)	5.1 (19.0)	8	1	—	52 (11)	—	2 (1)	1
Psychometrics.....	36 (2)	2.9 (5.6)	19	2	7	5	—	3 (2)	2 (1)
Indust. Personnel.....	88 (14)	7.1 (15.9)	1	5 (2)	22 (5)	1	57 (6)	2 (1)	1 (1)
Experimental ¹	119 (98)	9.6 (82.4)	5 (1)	2 (1)	10 (6)	1 (1)	—	101 (89)	99 (88)
Personality.....	6 (4)	0.5 (66.7)	—	—	—	—	—	6 (4)	6 (4)
Social Psych.....	19 (11)	1.5 (57.9)	1	1 (1)	5 (1)	—	—	12 (9)	9 (6)
Statistics.....	3 (3)	0.2 (100.0)	—	—	—	—	—	3 (3)	2 (2)
Engineering Psych.....	1 (0)	0.1 (0.0)	—	—	1	—	—	—	—
Biomedical.....	5 (3)	0.4 (60.0)	1 (1)	—	2 (1)	—	—	2 (1)	1 (1)
Interdisciplinary.....	5 (1)	0.4 (20.0)	—	—	3	—	—	2 (1)	1 (1)
Univ. Teaching ²	145 (115)	11.7 (79.3)	—	—	—	—	—	145 (115)	124 (99)
Univer. Admin.....	9 (7)	0.7 (77.8)	—	—	—	—	—	9 (7)	—
School Teaching.....	10 (0)	0.8 (0.0)	—	—	—	10	—	—	—
Research Assist.....	10 (0)	0.8 (0.0)	—	8	—	—	—	2	2
Research Officer.....	3 (0)	0.2 (0.0)	—	—	1	—	2	—	—
Admin. Executive.....	30 (2)	2.4 (6.7)	—	1	12	9 (1)	8 (1)	—	—
Directors.....	25 (6)	2.0 (24.0)	7 (4)	12 (2)	5	1	—	—	—
Consultants.....	8 (3)	0.6 (37.5)	3 (2)	2	—	1 (1)	2	—	—
Probation Officers.....	4 (0)	0.3 (0.0)	4	—	—	—	—	—	—
Clergy.....	4 (0)	0.3 (0.0)	4	—	—	—	—	—	—
Other occupations.....	55 (1)	4.4 (1.8)	24	4	13 (1)	2	12	—	—
Total reporting.....	1,238 (514)	100.0 (41.5)	372 (115)	63 (15)	127 (24)	187 (39)	85 (9)	404 (312)	317 (260)
Percentage of total.....		100.0	30.0	5.1	10.3	15.1	6.7	32.6	25.6
(Percentage of doctoral group).....		(100.0)	(22.4)	(2.9)	(4.7)	(7.6)	(1.8)	(60.7)	(50.6)
Percentage with doctoral degrees.....		41.5	30.9	23.8	18.9	20.9	10.6	77.2	82.0

¹Including comparative and physiological psychology.

²Includes 26 non-student teaching assistants and demonstrators.

be clinical psychologists either are misclassified or, if functioning primarily in testing roles, may be chronically under-using their talents. In such case a remedy could be sought through providing more ancillary personnel at lower levels of training and/or re-evaluating functions in employment. The possibility exists, however, supported by the low proportions of doctorates in clinical (and counseling, school, and industrial) psychology that such specialty areas contain a large number of undertrained personnel who may be assuming titles or duties beyond their level of training. Data available in the present survey do not warrant firm conclusions on this matter but do raise questions of quality of service and should be further studied.

Finally, as we examine the proportions of each specialty and of the work force generally in each type of employing institution several observations can be made. First, approximately one third of Canadian psychologists (and almost two thirds of those with doctoral training) are in university settings, the largest portion (25% of *all* psychologists and 50% of *all* doctorates in Canada) are located in formally identified departments of psychology.

Health and welfare departments and agencies are almost as important employers of psychologists (30%), accounting for two-thirds of all psychologists in the clinical field. Schools, in turn, employ 15% of the work force; the remaining workers are in various government agencies (10%), business and industry (7%) and research institutes (5%). In contrast with the high proportion of doctorates in university psychology departments (82%), fewer than one third of those employed in health and welfare hold doctorates, and the percentage declines to just over ten for those in business and industry.

With respect to chronic arguments about training between academic and "field" psychologists, some insight may be gained from the distribution of specialties across employment institutions and as well from the disparity in general level of training as between those in university settings and those outside universities. Neither the arguments nor their merits can be meaningfully discussed in the context of the present study but the data of Table 16 point up some fundamental differences in the characteristics of the two groups.

One final observation should be made here. Canadian universities, by virtue of widespread, direct, and increasing governmental subsidy, are quasi-governmental institutions, and the largest segment of health and welfare agencies and research institutes, as well as schools, are governmental or at least government-supported. It becomes apparent, therefore, that fewer than 15% to 20% of psychologists in Canada work in the "private sector" of the economy. Government at all levels, then, has a direct and significant interest, not only in psychological research and its outcome, but in matters pertaining to the availability and quality of training facilities and the quality and availability of psychologists for its many functions.

Chapter 2

PSYCHOLOGICAL RESEARCH IN CANADA

2.1 Research Financing Questionnaire

The data reported in this Chapter are derived principally from the Research Financing Questionnaire (Appendix 1, Part 2), which was returned by respondents who indicated that they were currently engaged in research. Characterization of these respondents in the terms of the preceding Chapter, however, is of course based upon data from the Professional Manpower Survey (Appendix 1, Part 1) completed by all respondents.

2.2 Number of Psychologists Engaged in Research

Two categories of psychologists are of concern in this section: (1) the inclusive category of all persons engaged in research—called “Research-Involved Psychologists” (RIP’s)—and (2) the sub-group of persons in charge of independent research projects that are supported by granting agencies—called “Principal Research Investigators” (PRI’s).

The total number of research-involved psychologists responding was 656¹, of which 250 are principal investigators. Thus almost half (49.6%) of the respondents are engaged in research and 18.9% are in charge of grant-supported research projects. Projecting these proportions to the total psychologist population we could expect to find some 800 persons with some research involvement and about 300 PRI’s in the estimated 1,600 psychologists in Canada.

2.3 Types of Institutions Employing Research Psychologists

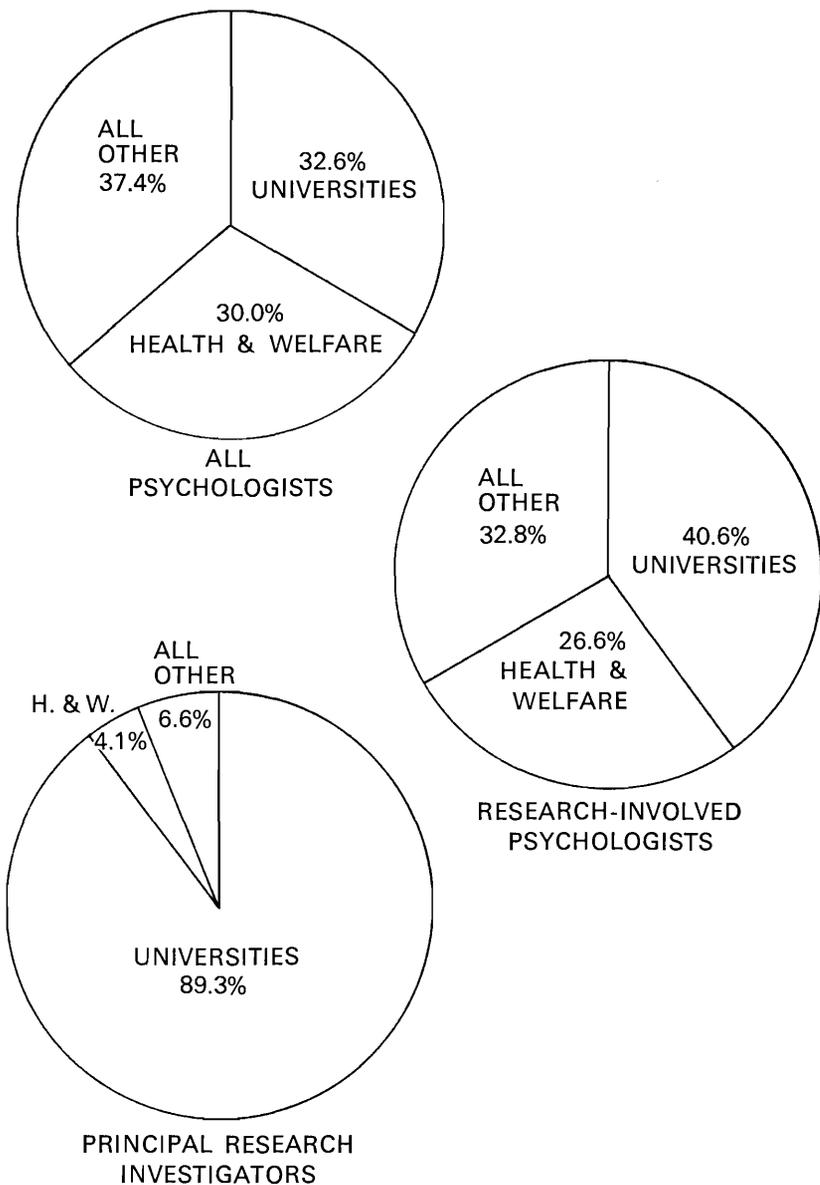
Figure 5 shows the proportions of research psychologists found in universities, health and welfare organizations, and other types of institutions (i.e., schools, government, research institutes, and business and industry).

The most striking feature of Figure 5 is the heavy concentration of research psychologists in universities (40.6% of RIP’s and 89.3% of PRI’s).² Approxi-

¹ Table 13 showed some 148 of the 1,091 psychologists there reporting as engaged in research as their principal function and an additional 259 so engaged as a major secondary function. This combined 37.3% of psychologists indicating a significant commitment to research is consistent with the proportions here reported as having some research involvement (49.6%), on the one hand, and being principal investigators (18.9%), on the other.

² Comparable figures for other types of institutions are as follows:

Health and Welfare	26.6% of RIP’s,	4.1% of PRI’s
Schools	12.2% " "	2.1% " "
Government	9.1% " "	0.4% " "
Research Institutes	6.7% " "	3.3% " "
Business and Industry	4.8% " "	0.8% " "



PERCENTAGES OF ALL PSYCHOLOGISTS, RESEARCH-INVOLVED PSYCHOLOGISTS AND PRI'S IN UNIVERSITIES, HEALTH AND WELFARE SETTINGS AND OTHER INSTITUTIONS

FIGURE 5

mately two thirds of all university-based respondents are engaged in research and over half are PRI's (263 and 217, respectively, of 404 reporting). Except that some collaborative grant-supported research is known to be conducted between university-based psychologists and those in other settings, it seems clear that the bulk of such work is concentrated in university settings and directed by university-based personnel. Health and welfare agencies and departments have the next largest concentration of persons engaged in research (26.6%) but the number of independently supported investigators is insignificant (4.1% of total). The remaining one third of those doing any research are divided among other types of employers, with the fewest found in business and industrial settings (4.8%). Such settings contain practically no independent investigators.¹

2.4 Areas of Research Activity

Figure 6 shows the percentage of the 656 research-involved psychologists engaged in each of the major areas of research.² Half the RIP's cited experimental (including comparative and physiological) psychology as an area in which they were currently engaged. One quarter (26%) were doing research in clinical psychology, while 16% cited each of educational and industrial psychology³ as fields in which they were involved in research. From 13.3 to 3% indicated the other areas shown, while fields such as psycholinguistics, school psychology, statistics, "general" and "other" psychology were named by only 1 to 2%.

It will be seen later (Section 2.9) that the relative numbers of grants awarded for research in each of the major areas tends to reflect—more or less—the relative proportions of research persons working in those areas,⁴ except that in the fields of clinical, counselling, educational, and industrial psychology, the respective proportions of grants received are considerably below the proportions of RIP's in these fields. In experimental (including comparative and physiological) psychology, which receives by far the largest amount of grant support (compared with other areas in psychology), the chances are better than 1 in 2 that an RIP's project is grant supported (327 RIP's, 195 grants). In clinical psychology this likelihood drops to approximately 1 in 5 (170 RIP's, 37 grants), in educational psychology to 1 in 6 (104 RIP's, 17 grants), in industrial psychology to 1 in 10 (102 RIP's, 11 grants), and in counselling psychology to 1 in 20 (38 RIP's, 2 grants).

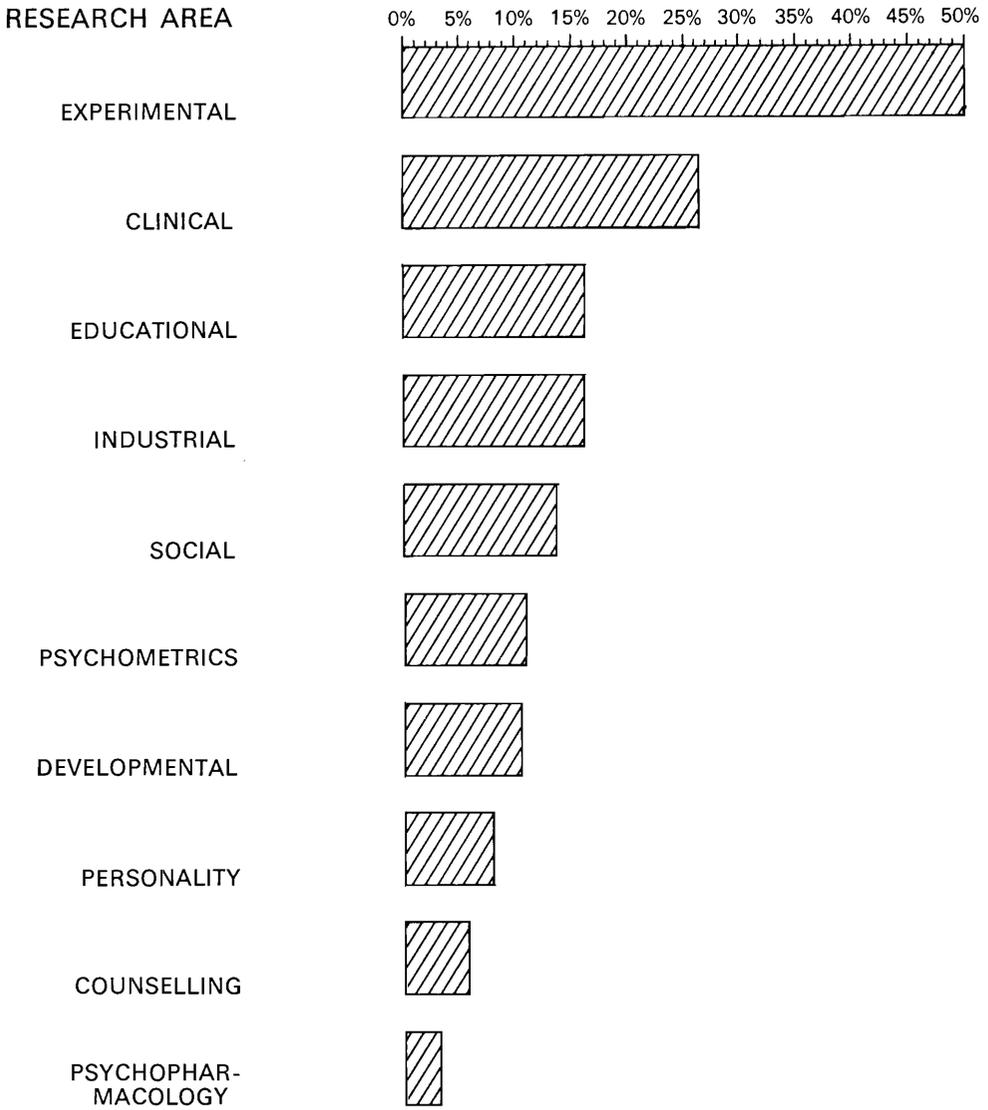
Assuming that these discrepancies do not arise from higher average numbers of investigators on a single project in these areas than in experimental psychology, it is clear that grant support is not evenly distributed across interest areas of

¹ But see p. 41 for discussion of employer-supported research investigations.

² Respondents could indicate more than one research area, where applicable.

³ Since only 4.8% of RIP's were reported as located in business and industry it can only be presumed that many engaged in research in this area are not employed in industry.

⁴ To the extent that many respondents who engage in research do so in more than one area, the sum of proportions of RIP's in the various fields exceeds 100%, whereas grant proportions add up to 100%. It can nevertheless be noted that only in the field of experimental (including comparative and physiological) psychology does the proportion of grant support exceed the proportion of RIP's. In all other fields—and especially those noted above—grant support appears disproportionately low compared with the number of research psychologists in the particular areas for which grants were awarded.



PERCENTAGES OF PSYCHOLOGISTS
 ENGAGED IN RESEARCH
 IN VARIOUS AREAS

FIGURE 6

research psychologists. However, it should be noted that some of the areas, particularly educational and industrial, derive considerable support from employer sources (see Section 2.8). Clinical and counselling psychology and the areas of personality and psychometrics research appear to be poorly supported (in proportion to the numbers engaged in research in these fields) in terms both of independent grants and of employer or institutional funds received. Further discussion of research support in the various sub-areas of psychology is included in Section 2.7 and beyond.

2.5 Doctorates and Research Involvement

The doctorate in psychology is traditionally a research degree.¹ It is therefore not unexpected that 60% of the research-involved psychologists would be doctorate holders and that 88.4% of those identified as principal investigators would have doctorates. (Of the remaining 11.6% of PRI's, only 2% have no advanced degree, the remaining 9.6% are at the Master's level or better.)

It has already been noted (Sections 1.7 and 1.12) that Canada's psychological community is dependent to a significant extent upon U.S. citizen members at the doctoral level, particularly in filling its teaching and research functions. Consistent with the earlier observations it may here be reported that 30% of PRI's are Americans, and an additional 6% of PRI's are citizens of other foreign countries. Further, 126 of the 221 principal investigators at doctoral level (or 57%) earned their degrees from U.S. institutions.

2.6 Research Financing: Some General Observations

It is estimated that there were 300 principal research investigators in Canada's psychological community, receiving a total of approximately \$3.5 million in grant support in 1966². Somewhat over a third of this support derives from Canadian federal sources, about a third from U.S. government sources, and most of the remainder from other Canadian sources.

The average value of grant support from the Canadian federal government per psychologist in Canada is estimated to be approximately \$835.³ Comparative figures for the U.S. are difficult to obtain, but one source⁴ has estimated the total 1967 U.S. Federal commitment to psychological research at \$157,911,000. Based on our earlier estimate of 32,000 U.S. psychologists, this would yield an average federal grant per U.S. psychologist of just over \$4,900.

These figures suggest a five-fold difference in level of support from federal sources in the two countries. Even if the estimates of U.S. grant support from

¹Of the 527 respondents holding doctorates, 393 or 68.6% are RIP's, and 221 or 41.8% are PRI's. Only 39.1% of non-doctoral respondents report involvement in research, with 4.3% serving as principal investigators.

²Extrapolation from sample size was in this case further corrected on the basis of telephone sampling of non-respondents and analyses of data obtained independently from granting sources. Throughout this and the succeeding sections on research financing it should be kept in mind that *relative* statements—e.g., proportions of Canadian grants from Canadian and U.S. sources—are based upon data furnished by respondents; whereas summary statements—such as this estimate of total grant support—include corrections for sampling, as explained at the end of the present Chapter.

³Based on annual value of reported grants corrected for sample (\$1,341,000).

⁴*Mental Health Scope*, Vol. 1, No. 2 12/22/66, Wash., D.C.

federal sources are grossly exaggerated or greatly inflated over the 1966 figures, there is little question that a difference of some significant proportion remains. Two factors that contribute to this difference should be noted, although it is doubtful that correction for them would restore parity between the two countries. One is the typical inclusion of an item to cover indirect costs (or overhead) in U.S. federal grants; the second is the allowance for direct compensation to principal research investigators in grants from U.S. agencies.¹

Canadian federal grants normally bar both overhead payments and any compensation to principal investigators in universities.² Other factors that contribute to the differences are the larger number and amounts of U.S. grants for major installations and subsidy of research through training grants, scholarships, etc. on a wider scale than has been current in Canada. On the other hand, Canadian provincial grants may be proportionately larger than funds provided for psychological research by the various states. Data on State grants were not available to permit such a comparison.

Canadian federal government grant support of psychological research has increased by 350% from 1961 to 1966³. In the same period U.S. government grant support of psychological research in *Canada* has increased by approximately the same factor⁴.

Comparable figures on the increase in governmental support of U.S. psychological research are not available, but one source indicates that

“Psychological and Social Sciences have shown a faster annual growth rate in the decade from 1956 to 1966 than have all the other sciences combined.”⁵

Over 80% of Canadian federal grant support is for essentially “basic” research. The same holds true for U.S. federal grant support to psychologists in Canada. In addition to external grant support, however, some \$3,500,000 is estimated to be expended for “intramural” psychological research by business and industry, educational, research, and governmental institutions, etc. In contrast to the extramurally funded research, 90% of intramural research funding is for work that can be classified as essentially “applied”. (See Sections 2.7 and 2.8).

¹In the case of investigators who hold university appointments this ordinarily covers 2/9ths of the PRI's base salary while for investigators in other settings a larger part or all of his salary may be included.

²Canadian university presidents receive small annual NRC grants in lieu of overhead in proportion to the amount of NRC funds awarded to investigators in their institutions. At present this amounts to 7.5% of NRC awards and is considerably below the overhead amounts received by U.S. institutions on *all* grants. The Canadian Association of Graduate Schools has urged Canadian federal agencies to modify their policy on overhead but no policy change appears imminent. In regard to investigator stipends, Canadian universities have, in increasing numbers, undertaken summer research stipend programs in an attempt to overcome the differences between Canadian and U.S. government-granting policies. (Appley, M. H. “Report on Summer Research Stipend Practices of Canadian Universities,” C.A.G.S. Ottawa, Oct., 1966.)

³It should be recognized that statements relating to temporary trends depend upon retrospective data from the respondents and may therefore be subject to distorting factors of memory.

⁴Recent information (Minutes, Associate Committee on Experimental Psychology, NRC, February, 1967) suggests that the threatened curtailment of U.S. government research support for psychologists in Canada (and elsewhere outside the U.S.) is now taking place. Notice of termination of U.S. support has been received by several principal investigators in Canada to date and information informally supplied by U.S. sources suggests that further terminations can be expected on the basis of U.S. fiscal policy regarding dollar outflow to non-U.S. residents.

⁵*Mental Health Scope*, op. cit.

The remainder of this Chapter will be devoted to detailing the research financing situation. The intention is to present data sometimes in terms of *annual* value of current grants and sometimes in terms of *total* value. The two terms do *not* have the same meaning, nor are the values the same. Respondents supplied information on the total value of their current grants, and this total value was appropriately used to assess the relative weight of current support for the different types of research.

On the other hand, it was necessary to obtain an *annual* value of current grants in order to present comparative data on the granting agencies and their relative contributions as well as the distribution of funds by province. Accordingly, annual values were calculated from the total values given, utilizing the term and beginning date of each current grant.¹

The total value of current grants is, of course, the larger figure. The total value of reported grants current in 1966 is \$3.18 million; the annual value is \$2.81 million. (But see corrected estimates at end of the Chapter.)

2.7 Grant Support for Basic vs. Applied Research

Table 17 gives the distribution of grants by source of support across “basic”, “basic/applied”, “applied/basic”, and “applied” categories. (See Appendix 1 for definition of these terms.)

It is apparent that grant funds from government and other independent granting agencies are in the main used to support basic research considerably more heavily than applied research. (The ratio of basic to applied is 4:1). “Basic” research accounts for approximately two fifths of the total (42% of grants, 38% of amount), and “basic/applied” another two fifths (41% of grants, 40% of amount). Only 4 to 6% of all identified grants could be categorized as strictly “applied” research.

Canadian and U.S. federal governments and Canadian universities are most heavily committed to basic and basic/applied research. Provincial sources are predominantly obligated to the “basic/applied” type of research, while the limited funds available for psychological research from other granting sources are practically equally distributed across basic and applied project categories.

In terms of relative contribution of agencies to the total amount for “basic” research, Canadian federal and U.S. federal sources provide equal amounts,

¹Examples of the procedure are given to clarify the concept of “annual value”. In the case of a one-year grant beginning anytime from 1/66 to 4/66 and ending a year later, the total value was taken as the annual value. In the case of a two-year grant beginning at that period, half the total value was taken, etc. Grants ending before mid-1966 were discounted for the annual value figures. In the case of grants running for less than a year, within 1966, the total value was taken. Most of the reported grants were of these types. However, some grants were reported as beginning 9/66 or later, and in these cases equal distribution of funds over time was assumed, and the proportion available in 1966 was determined. Intermediate cases were dealt with in the most “reasonable” fashion, on the basis of modal starting dates reported for the agency in question or other information on the grant. Thus “annual value” may be interpreted fairly closely as “value of funds available over the period: first part of 1966 to first part of 1967, assuming equal annual distribution of grants operating for more than one year”. It is neither equivalent to “total amount granted in 1966, divided by the number of years in its term”, nor to “amount available in 1966, assuming equal distribution over time”. The former concept could not be used consistently, because information on date of award was not reported. The latter concept could not be used consistently without violating the customary method of reporting by agencies.

Table 17.—Amounts of Grant Support for Basic and Applied Research by Granting Source
(Based on Total Value of Grant Awards Current in 1966)

Granting Source	Type of Research						Unclassifiable		Total		Mean \$ value per grant		
	Basic no.	Basic \$ value	Applied no.	Applied \$ value	Basic no.	Basic \$ value	Applied no.	Applied \$ value	no.	\$ value			
<i>Canadian:</i>													
Federal.....	91	539,535	63	438,443	10	198,473	1	300	2	11,300	167	1,188,051	7,114
Provincial.....	5	51,194	25	373,128	15	126,651	7	92,750	—	—	52	643,723	12,379
University.....	24	28,249	25	26,293	6	5,610	2	2,100	1	450	58	62,702	1,081
Other.....	2	15,200	12	61,523	7	65,400	3	12,500	—	—	24	154,623	6,442
Total Canadian.....	122	634,178	125	899,387	38	396,134	13	107,650	3	11,750	301	2,049,099	6,808
<i>U.S.:</i>													
Federal.....	27	540,796	20	366,387	4	84,000	1	76,667	1	32,500	53	1,100,350	20,761
Other.....	2	29,600	2	1,134	—	—	—	—	—	—	4	30,734	7,683
Total U.S.....	29	570,396	22	367,521	4	84,000	1	76,667	1	32,500	57	1,131,084	19,844
Other Foreign.....	1	300	1	200	1	4,000	—	—	—	—	3	4,500	1,500
Grand Total.....	152	1,204,874	148	1,267,108	43	484,134	14	184,317	4	44,250	361	3,184,683	8,822
Percentage of Total.....	42.1	37.8	41.0	39.8	11.9	15.2	3.9	5.8	1.1	1.4	100.0	100.0	
Mean Value per Grant.....		\$7,926		\$8,562		\$11,259		\$13,165		\$11,062		\$8,822	

together accounting for 89.7% of the \$1,204,874 devoted to basic projects. All other sources combined account for the remaining 10.3% of the support of basic research.

Provincial sources contribute the largest single portion (39.4%) of the \$1,267,108 supporting "basic/applied" research.

Canadian federal and provincial sources together provide two thirds of the total reported in support of "applied/basic" research (41.0% and 26.2%, respectively).

Half (50.3%) of the much smaller amount supporting "applied" research¹ comes from provincial sources; the U.S. federal government contributes another two fifths (41.6%).

Mean amounts per grant by source show a wide range—from university grants of \$1,081 to U.S. federal grants of \$20,761. The numbers of grants in certain categories (Other Foreign, Other U.S.) are too small to permit comment. Several general comparisons can be made, however.

First, there is a marked difference in mean values per grant to Canadian investigators as between Canadian and U.S. federal sources (\$7,114 and \$20,761, respectively). This difference parallels the finding (Section 2.6) with respect to the support of the two governments of their own indigenous research; some of the comments about the discrepancy in level made there could be applied to this difference as well.²

The considerably smaller average size of Canadian university grants, as compared with grants from other Canadian sources, suggests that these are in the nature of "starter", or "interim", or supplementary grants rather than ordinary research support. That universities depend upon outside agencies for "regular" research support is widely known. On the basis of the contrasting amounts here evident it seems reasonable to conclude that universities at present must be seen as a supplementary rather than an independent source of research support.

One final comparison warrants comment. Although considerably fewer grants are awarded by the provinces, they are much larger in size than federal grants, a fact that is only partially explained by the greater proportional support of applied research at the provincial level.

The mean amounts per grant by type of research show a steady increase as one moves from basic to applied types, although there are many fewer projects of the latter type supported by extramural grant funds. One could conclude that while basic research is more *widely* supported (i.e., in number and total dollar value of grants), applied research may be *better* supported (i.e., in mean dollar value per project).

These figures of course, reflect only the support of independent projects by government and other external granting sources. The picture cannot be completed without considering intramural research support from employer sources.

¹ But see discussion of Employer Support for Basic and Applied Research in the next Section.

² If the extensive U.S. federal support for Canadian research is indeed to be curtailed in 1967 and succeeding years, the effect may be not only to throw a greater burden on Canadian sources but also to adversely affect those principal investigators whose direct compensation is presumed to be incorporated in U.S. grants in Canada but would be prohibited by Canadian federal granting policies.

2.8 Employer Support for Basic vs. Applied Research

In addition to the more than \$3 million reported as available from governmental and other external granting agencies in support of independent research, approximately \$3.6 million worth of research can be identified as intramural, employer-supported. This amount of support of psychological research by employing institutions clearly constitutes a major feature of the research financing picture.

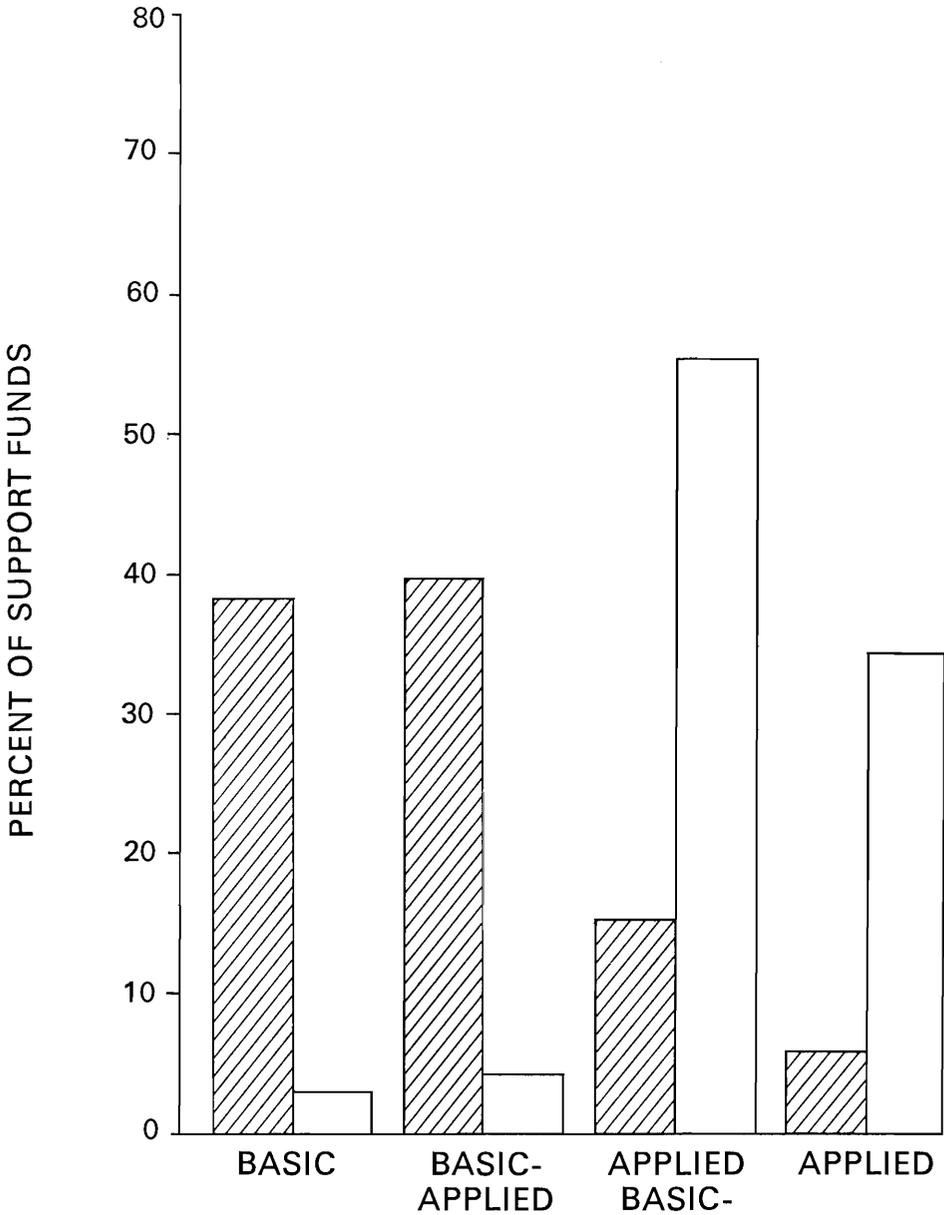
Unfortunately, the data obtained in the relevant section of the Questionnaire are less clear than information available on grant support. There is reason to believe that in some instances dollar values reported reflect charges to clients, and in others actual research expenses. Further, the suspected lack of uniformity with respect to inclusion by respondents of various direct and indirect overhead items, total salaries, etc. makes the extensive analysis of these data highly questionable. We shall therefore restrict ourselves to examination of the few aspects of the data on employer-supported research that are unlikely to have been distorted by ambiguities in responses received.

Funds for research supported intramurally by employing institutions are heavily committed to "applied" problems (Table 18). Although 43.3% of projects can be classified as more basic than applied, their total support represents only 7.4% of research funds available from employer sources. Figure 7 compares the proportions of basic and applied research supported by granting agencies and employing institutions. The sharp contrast may be somewhat lessened by discounting possible inflations of amounts of applied projects (see above) but the differences are striking in any case.

Table 18.—Distribution of Amounts of Current Basic and Applied Research Support by Employing Institutions and Mean Value per Grant for Each Type

Type of Research	Amount	Percentage of total amount	Number of projects	Percentage of total projects	Mean value per project
Basic.....	\$ 107,000	2.9	19	14.2	\$ 5,632
Basic/Applied.....	163,000	4.5	39	29.1	4,179
Applied/Basic.....	2,077,000	56.8	31	23.1	67,000
Applied.....	1,277,000	34.9	38	28.4	33,605
Unclassified.....	32,000	0.9	7	5.2	4,571
Total.....	3,656,000	100.0	134	100.0	27,284

We noted earlier (Table 17) a difference in mean dollar value of grant-supported projects in favor of applied projects. The difference is even more dramatic in employer-supported research, except that the mean value per "applied/basic" project supported by employing institutions is twice that per "applied" project (Table 18). No explanation can be offered for this finding. One could suggest that it is the role of government and of independent granting agencies to



RELATIVE DOLLAR VALUE OF SUPPORT OF BASIC AND APPLIED RESEARCH BY

-  GRANTING AGENCIES
-  EMPLOYING INSTITUTIONS

FIGURE 7

identify themselves with the development of new knowledge, rather than with the solving of practical problems within the purview of institutional employers. This is not to advocate mutual exclusiveness of interest, but rather to affirm the legitimacy of the employment of public and quasi-public funds for the extensions of human knowledge even where no immediate "pay-off" is apparent.¹ If, in addition, public funds are directed to applied or immediate problems this is all to the good but the unique responsibility of granting agencies is to jealously guard and vigorously pursue their role as primary supporters of the development of new general knowledge through basic research.²

Further details on the distribution of employer-initiated support are given in Tables 19 and 20.

Table 19.—Amounts of Research Support in Major Areas Derived from Employing Institutions

Major Area	Amount	Percentage of Total
Clinical.....	\$ 56,000	1.5
Counselling.....	77,000	2.1
Developmental.....	4,000	0.1
Educational/School.....	1,650,000	28.7
Engineering.....	—	—
Experimental.....	306,000	8.4
Industrial.....	807,000	22.1
Personality.....	66,000	1.8
Pharmacology.....	136,000	3.7
Psycholinguistics.....	—	—
Psychometrics/Statistics.....	15,000	0.4
Psychology—Other.....	1,000	0.0
Social/Soc. Problems.....	21,000	0.6
Other—Non-psychology.....	—	—
Interdisciplinary.....	—	—
Unclassified ¹	1,117,000	30.6
Total.....	\$3,656,000	100.0

¹Insufficient information supplied by respondents to permit classification.

Many projects could not be classified on the basis of information supplied by respondents. Nevertheless Table 19 shows that the largest amounts of identified institution-funded research are in the areas of educational and school psychology (over \$1 million) and industrial psychology (\$807,000), with substantial sums supporting experimental psychology and psychopharmacology (\$306,000 and \$136,000, respectively).

¹Note the similarity in pattern of distribution of Canadian and U.S. federal funds in Canada as between basic and applied research (see Table 17). This pattern is, however, not the same for provincially funded research, a difference that may have meaning in its own right.

²The writers are aware of their own prejudice in regard to the importance of preserving and extending the support base for basic research in its own right.

**Table 20.—Amounts of Employer Supported Research in Different
Types of Employing Institutions**

Type of Employing Institution	Amount of support	Percentage of total	Modal category
Hospitals.....	\$ 3,000	0.1	Applied
Business management.....	410,000	11.2	Applied
Psychiatric research institutes.....	14,000	0.4	Applied
Other research institutes ¹	207,000	5.7	Applied
Industrial—Personnel ²	454,000	12.4	Applied; Applied/Basic
Recreational—Industrial.....	28,000	0.8	Applied/Basic
Clinical—Research institutes.....	60,000	1.6	Applied/Basic
Schools (Elementary & Secondary).....	1,000,000	27.4	Applied/Basic
Psychiatry departments.....	150,000	4.1	Applied/Basic
Other academic departments (not psychology).....	512,000	14.0	Applied/Basic
Alcohol addiction, drug research institutes.....	50,000	1.4	Basic/Applied; Applied/Basic
Federal government administration.....	49,000	1.3	Basic; Basic/Applied
Psychology departments.....	126,000	3.4	Basic
Provincial government administration.....	9,000	0.2	Unclassified
Unclassified ³	584,000	16.0	
Total.....	\$3,656,000	100.0	Applied/Basic

¹One large research institute, The Ontario Institute for Studies in Education, was in its formative stages in 1966, and most of its current research-involved psychologists came on staff too late (September) for inclusion in these data (personal communication). Inasmuch as data from this institute—and other new research organizations, if any—would be included in future surveys of employer-supported research, totals for 1967 or later would be appreciably higher than those reported here.

²Includes training and development, employee morale and attitudes, performance evaluation, and criterion development.

³Insufficient information supplied by respondents to permit classification.

Table 20 reveals that elementary and secondary schools are by far the largest supporters, and consumers, of institutional research, accounting for over a quarter of the total spent. An amount almost as large is accounted for by business and industrial institutions; universities provide about one fifth of the total of institutional research support. Only approximately 10% of institutional research support can be formally identified with research institutes, the balance being largely unclassifiable.

Regarding senior research personnel, some 82 persons are identified as principal research investigators or project directors for institutional research. Of these, 47.6% hold doctorates and 14.6% have master's level training or better, and 37.8% have formal education to the baccalaureate level, only. These proportions are in sharp contrast with those reported earlier for grant-supported principal investigators (88.4%, 9.6%, and 2%, respectively).

Level of education is by no means the only criterion by which research capability can be judged, especially in a field that is changing so rapidly as is psychology. Whether other criteria justify ignoring the level of training in assigning research supervisory personnel, or the research in question is less sophisticated (e.g., primarily the accumulation of statistics) should most certainly be determined. The alternate conclusion, that the research doctorate is not needed by those who supervise psychological research, would require a drastic revision of all the assumptions underlying education and training in psychology. We rather doubt that this conclusion will be tenable. It seems more likely that persons at doctoral level, in this time of short supply, choose to conduct their own rather than institutional research and that institutions are forced to nominate (and train?) persons of lower educational levels to meet their own research needs. Nevertheless, the fact that so large a proportion of the intramural research project directors are at the baccalaureate level requires further study.

2.9 Distribution of Grant Funds Across Major Areas and Specialties of Psychology

A total value of \$3,184,683 was reported for 361 research grants current in 1966. Respondents used the "Major Areas and Specialties List"¹ (See Appendix 1) to characterize their research projects. Amounts and proportions of grant support in the major areas of psychology are shown in Table 21.

Table 21.—Numbers and Value of Grants Supporting Major Areas of Psychology
(Based on Total Value of Grants Current in 1966)

Major Area	Number	Percentage of total number	Value	Percentage of total value
Clinical Psychology.....	37	10.2	\$ 224,451	7.0
Counselling and Guidance.....	2	0.6	18,400	0.6
Developmental Psychology.....	23	6.4	246,393	7.7
Educational Psychology.....	17	4.7	157,391	4.9
Industrial and Personnel Psychology.....	11	3.0	223,000	7.0
Personality.....	7	1.9	25,900	0.8
School Psychology.....	1	0.3	4,000	0.1
Social Psychology.....	32	8.9	244,374	7.7
Social Problems, Social Disorganization....	5	1.4	41,200	1.3
Experimental, Comparative and Physiological Psychology.....	195	54.0	1,665,524	52.3
Psychometrics.....	5	1.4	18,570	0.6
Statistics.....	2	0.6	3,100	0.1
Psychopharmacology.....	7	1.9	75,074	2.4
Psycholinguistics.....	1	0.3	5,000	0.2
Psychology—Other.....	2	0.6	9,656	0.3
Interdisciplinary.....	3	0.7	72,000	2.3
Other.....	1	0.3	650	1
Unclassified.....	10	2.8	150,000	4.7
Total.....	361	100.0	\$3,184,683	100.0

¹Less than .1%.

¹Based on U.S. National Sciences Foundation Roster of Scientific and Technical Personnel list for Psychology.

Of the major areas, experimental (including comparative and physiological) psychology received more grant support than *all* other areas combined (54% of grants, 52.3% of total value) for a total of \$1,665,524. Four areas (developmental, social, clinical, and industrial-personnel psychology) each received between \$223,000 and \$247,000, or from 7 to 8% of the funds available. Except for educational psychology, which had 4.9% (\$157,000) of grant funds, no other area received more than \$75,000 (or 2.4%) of grant support in 1966.

Table 22 shows the support levels of specialties within major areas.¹

Note that the areas of clinical, experimental, educational, and social psychology were nominated by significant numbers of respondents as “underdeveloped” and hence requiring increased support.² The same four areas were also named as “especially promising” and hence deserving of increased support.³ Among the specialties, those marked with asterisks in Table 22 were most often recommended by respondents for increased support (without, of course, knowledge of actual current support levels). However, no major areas or specialties were named nearly so frequently as the above four.

The data from which Table 22 is derived (See Appendix 4) reveal that of the total value of grants current in 1966 nine sub-areas received support in excess of \$100,000. These groupings were as follows: \$439,208 (13.8%) was given for 52 projects in the five related specialties of perception, sensory processes, audition, vision, and psychophysics; 12.1% (\$348,498) went to 59 projects in animal and human learning; 11% (\$350,647) was awarded for 34 projects in CNS functions and electroencephalography; 4.9% (\$156,955) was granted for 13 projects in motivation. All of these projects are in the major area of “experimental, comparative and physiological psychology”. The remaining 27 projects in this major area accounted for 10.5% (\$334,216) of the total. In other areas the three specialties for which more than \$100,000 was awarded were: experimental psychopathology (\$104,796 for 13 projects); childhood and adolescence (\$154,035 for 11 projects); and employee morale and attitudes (\$104,300 for 4 projects). These amounts accounted for 3.3%, 4.8%, and 3.3% respectively, of the total granted. To some extent of course, investigator preference determines the considerable imbalance observed in relative support. Other factors, however, are undoubtedly influential in determining the dollar value of support in different areas and specialties. Amongst these the policies and interests of the granting agencies, in conjunction with the relative amounts of funds at their disposal, must surely play an important part. In addition, the relative cost of projects in different specialties must be considered in light of the amount and sophistication of required equipment and facilities, size of necessary staff, etc. Dollar value of grant support by staff, then, cannot be accepted as an index of the adequacy or inadequacy of support in a given area or specialty.

¹ Table A-3 in Appendix 4 provides detailed information on the number of grants and total amount of support in each of the specialties.

² The respective numbers of nominations were 725, 393, 270 and 178. Respondents could name as many as three areas, but a maximum of 1,323 nominations could be received by any one area.

³ The respective numbers of nominations were 500, 579, 246, and 209.

Table 22.—Levels of Grant Support Currently being Provided for Specialties within Areas of Psychology

Area	Significant support (\$100,000 or more)	Modest support (\$25,000–100,000)	Little support (Less than \$25,000)	No support
Clinical.....	*Experimental psychopathology	*Behavior problems	*Community mental health *Crime and delinquency *Mental deficiency Objective tests Speech pathology	*Group therapy Individual diagnosis *Psychotherapy Projective techniques
Counselling.....			Rehabilitation Vocational counselling	Educational counselling Nondirective therapy Personal adjustment
Developmental.....	*Childhood and adolescence	Maturity and old age Infancy		Nursery and pre-school
Educational/School.....		*School learning *Special education	Educational measurement Programmed learning *School psychology Teacher personnel	School adjustment Student personnel
Engineering.....				Engineering
Experimental.....	Animal learning *CNS functions EEG *Human learning *Motivation *Perception Sensory processes	Autonomic functions Psychophysics	Apparatus design and evaluation Audition Communication, information Motor skills *Symbolic processes and problem solving Vision	Feeling and emotion
Industrial.....	Employee morale	Market research, advertising Organizational behavior	Employee and executive training Job analysis	Labor-management relations Performance evaluation

			Recruitment, selection Safety research	Criterion development
Personality.....			Development Measurement Personality and learning Personality and perception	Personality and body Personality theory Structure and dynamics
Psycholinguistics.....			*Psycholinguistics	
Psychometrics /Statistics			Factor analysis Statistics Test construction and validation Test theory /scale analysis	Experimental design High-speed computers Mathematical models
Psychopharmacology....		Psychopharmacology		
Social.....		Group interaction Symbolic communication Attitudes Cultural deprivation	Culture and personality Social perception	Collective behavior and social movements Leadership Public opinion Reference groups Role behavior
Social Problems.....			Criminology Poverty and dependence Social conflict	Deviance
Other areas.....		Interdisciplinary	Other psychology specialties	

*See p 43 for explanation.

2.10 Relative Contributions of Granting Agencies

The total *annual* value of current grants was calculated to be \$2,813,697 for 324¹ research projects continuing through 1966 (Table 23). Over two thirds of this total came from seven sources, 3 Canadian and 4 American. The National Research Council of Canada contributed over half a million dollars. The U.S. Public Health Service (including the National Institutes of Health) and the Ontario Mental Health Foundation each supplied over a third of a million dollars. Four other sources, U.S. Office of Education, U.S. Advanced Research Projects Administration, U.S. Office of Naval Research, and Canadian Defence Research Board each accounted for support in excess of \$100,000.²

The balance of funds derive from a great many Canadian and U.S. sources, but only 0.2% are supplied from outside the two countries.

¹ Of a total of 361 grants reported, 37 were not included in calculations of annual value of current grants because they were due to expire in the Spring of 1966.

² But see footnote 1 to Table 23. It is likely that the contribution of the Department of National Health and Welfare is considerably higher than that reported here.

Table 23.—Sources and Annual Value of Current Grants Reported

Source ¹ (as reported)	Number of grants reported	Value
<i>Canadian Federal</i>	165	\$1,086,626
National Research Council.....	105	590,052
Defence Research Board.....	20	105,347
Dept. Justice.....	2	60,000
Canada Council.....	7	58,169
Medical Research Council.....	9	79,540
Can. Public Health Research Foundation.....	3	31,141
Nat. Health/Welfare.....	4	28,500
Dom. Prov. Ment. Health.....	4	36,865
DPH.....	2	22,620
Dept. Labour.....	2	17,550
Other Federal ²	7	56,842
<i>Canadian Provincial</i>	44	585,468
Alberta ³	3	67,833
B.C. Educ. Res.....	1	3,000
Manitoba.....	1	6,000
N.S. Alcohol. Found.....	1	3,950
Ontario Mental Health Found.....	24	338,048
Ontario—Other ⁴	7	55,637
Quebec ⁵	5	33,000
Provincial—not further specified.....	2	78,000

¹ It is apparent that several of the sources reported refer in fact to the same agencies (e.g., USONR and USN or USPHS, NIMH and NIH). However on the chance that error would be introduced by arbitrary grouping they are given here exactly as reported by investigators.

² RCBB, CEA, CRM, CNR, FPH, Dept. Northern Affairs and Natural Resources, OEO.

³ Div. Alcohol. Studies; Council Educ. Res. and unspecified Alberta sources.

⁴ Alcohol. and Drug. Res., Dept. Transport, Soc. Crippled Children, OISE, and unspecified Ontario sources.

⁵ Dept. Educ. and unspecified Quebec sources.

Table 23.—Sources and Annual Value of Current Grants Reported—Concluded

Source ¹ (as reported)	Number of grants reported	Value
<i>Canadian Universities</i> ⁶	49	78,740
<i>Foundations, etc.</i> ⁷	16	87,193
<i>U.S. Federal</i>	45	970,036
Public Health Services.....	15	265,273
National Inst. Mental Health.....	7	47,973
National Inst. Health.....	5	67,300
Office of Education.....	4	214,167
Advanced Res. Projects Admin.....	2	134,000
Office of Naval Research.....	3	116,124
Navy.....	2	30,000
National Science Foundation.....	5	77,449
Nat. Aeronautics and Space Admin.....	1	14,000
Dept. Health, Education and Welfare.....	1	3,750
<i>U.S. Universities</i>	2	1,134
<i>Other Foreign/International</i> ⁸	3	4,500
Grand Total	324 ⁹	2,813,697

⁶ 10 Universities (Alberta, British Columbia, Calgary, Dalhousie, Manitoba, McGill, Queen's, Simon Fraser, Toronto, Western Ontario) and universities not specified.

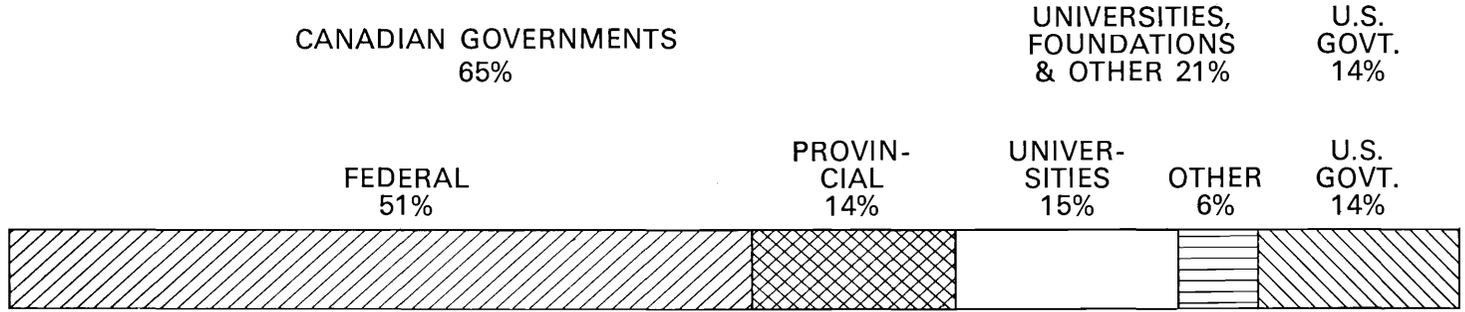
⁷ 4 Laidlaw Foundation grants and one each from Atkinson Charitable Foundation, DuPont, Foundations Fund for Research in Psychiatry, Imperial Oil, Institute Industrial Relations, Litton Systems, Mental Deficiency Association, Montreal Children's Hospital, Nuff. Travelling Fellowship, Stairs Mem. Fund, Zeller Family Found., and students.

⁸ London Board of Educ., U. of London, World Council of Churches.

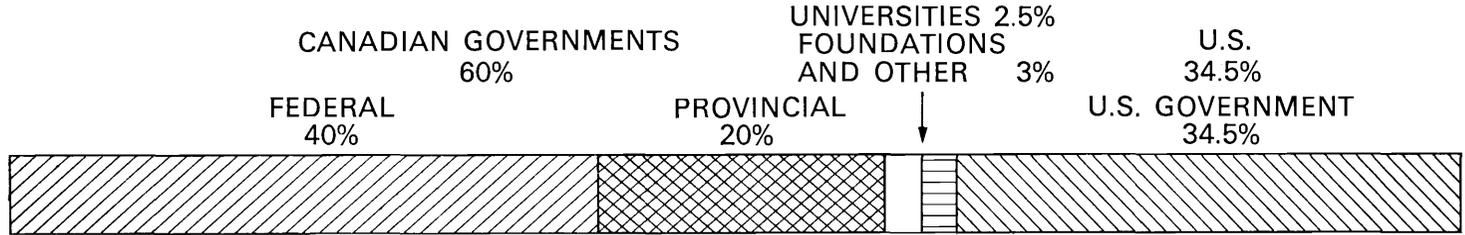
⁹ This number includes 32 grants for which term was not specified. In these cases the term was assumed to be for one year.

Figure 8 illustrates the proportions of grants and total funds from each source category. Canadian federal government grants account for over 50% of all grants awarded but only 40% of their total value. Both Canadian provincial and U.S. government sources supply 14% of grants awarded, but these account for 20% and 34.5% respectively of the annual dollar value of all grants current. University, foundation, and other sources combined provide over 20% of all grants received but account for only 5% of the funding.

Two implications are clear from an examination of Table 23 and Figure 8. First, U.S. government sources account for a substantial proportion of the research support of psychologists in Canada. Although such funds go to a smaller number of investigators, the aggregate amount is almost as large as that provided by Canadian federal government sources. Second, it is evident that the "private" and "quasi-private" sectors of the economy play an insignificant role in the granting picture. Foundations and private concerns account for no more than 3% of research funds awarded, while universities contribute even less (Table 23).



PROPORTIONS OF GRANTS AWARDED



PROPORTIONS OF ANNUAL DOLLAR VALUE

PROPORTIONS OF GRANTS AND AMOUNT OF SUPPORT AWARDED BY CANADIAN, AMERICAN AND NON-GOVERNMENTAL SOURCES (BASED ON ANNUAL VALUE OF CURRENT GRANTS, 1966)

FIGURE 8

2.11 Distribution of Grant Support by Province

One cannot assume that research funds, like political benefits, “ought” to be distributed across provinces in accordance with the proportions of their relevant professional populations. Nevertheless, it is of interest to examine the distribution of funds in the various provinces and this will be done in two ways: (1) the proportions of funds awarded by each type of granting source received in each of the provinces, and (2) the proportions of the total funds received in a given province that are derived from different granting sources. Tables 24 and 25 present this information and the total amounts in each category.¹

Cursory examination of Table 24 shows that Ontario is the only province for which a larger share of funds received from *all* sources than is proportionate to its percentage of psychologists in Canada is reported.² Three provinces, Prince Edward Island, New Brunswick, and Saskatchewan receive less in relation to their proportion of professional population from all sources. Other provinces appear to receive more from some sources and less from others than their percentage of respondents would seem to warrant.

In order to assess the equability of fund distributions in a more quantitative way, proportions of respondents to grant amounts were compared and a simple disparity formula applied. Table 25 shows the relative status of each province in these comparisons.

It is apparent that Ontario, Nova Scotia, and Alberta receive a greater share of the research support from Canadian federal sources than would be expected on the basis of the proportions of psychologists within their borders.

Ontario receives an even greater share of the non-federal Canadian support and of non-Canadian support. Conversely, Nova Scotia's share of funds from other Canadian sources is less than its share of federal funds, and its share of funds from all Canadian sources is higher than the proportion of U.S. funds that it receives. Both Nova Scotia and Alberta are somewhat favored by Canadian sources but not by U.S. sources, with the result that there is in total amount no marked disparity between support and number of psychologists.

Quebec presents the opposite picture. It receives considerably less than its apparent share from Canadian federal sources; it fares better with provincial or other Canadian sources; and receives so large a share of the U.S. funds that when total amount is considered it, too, shows no great disparity.

Saskatchewan appears to be generally but not markedly disfavored, as are Manitoba's psychologists until U.S. sources are brought in.

British Columbia is clearly the most poorly supported province in relation to psychologists there. It receives disproportionately low support from Canadian sources, and an even lower share of U.S. funds, so that in total support it stands in the most disadvantaged position.

¹Table A-5 in Appendix 4 presents details of amounts of awards by source and province.

²Data in this Section are based on proportions of respondents rather than estimated total psychologists in each province in order to compensate for biases resulting from differential provincial response rates.

Table 24.—Proportions of Grant Funds from Various Sources Received by Psychologists in Each Province
(Based on Annual Value of Current Grants)

Province	Percentage of Respondents in Province	Percentage of Can. fed. funds	Percentage of provincial funds	Percentage of Can. univ. funds	Percentage of Can. other funds	Percentage of Total Canadian funds	Percentage of Foreign funds (U.S. federal except where noted)	Percentage of Total
Newfoundland.....	0.3	0.4	0.0	0.0	0.0	0.2	0.0	0.1
Prince Edward Island.....	0.2	0.0	0.0	0.0	0.0	0.0	0.1 ¹	<0.1
Nova Scotia.....	3.2	9.3	0.7	4.0	4.6	6.1	1.4	4.5
New Brunswick.....	2.2	0.4	0.0	0.0	0.0	0.2	0.0	0.1
Quebec.....	19.2	12.1	18.1	16.5	21.7	14.7	28.4 ²	19.4
Ontario.....	46.5	55.9	66.0	49.4	64.6	59.2	59.4 ³	59.3
Manitoba.....	5.2	2.2	1.0	2.8	0.0	1.8	6.1	3.3
Saskatchewan.....	4.7	2.3	1.3	0.0	3.4	1.9	0.0	1.3
Alberta.....	8.8	11.9	11.9	8.1	4.0	11.4	2.5 ⁴	8.3
British Columbia.....	9.7	5.5	1.0	19.2	1.7	4.5	2.1	3.7
Total percentage.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Amount.....		(\$1,086,626)	(\$585,468)	(78,740)	(\$87,193)	(\$1,838,027)	(\$975,670)	(\$2,813,697)

¹U.S. University

²Includes 0.4% other foreign

³Includes 0.1% U.S. Univ. and other foreign

⁴Includes less than 0.1% other foreign

Table 25.—Grant Support in Relation to Proportion of Psychologists in each Province

	Disparity between percentage of funds awarded and percentage of psychologists in province	From Canadian federal sources	From all Canadian sources	From U.S. and other foreign sources	From all sources
More favored	12.0—13.9		Ontario	Ontario	Ontario
	10.0—11.9				
	8.0— 9.9	Ontario		Quebec	
	6.0— 7.9	Nova Scotia			
	4.0— 5.9				
	+2.0— 3.9	Alberta	Nova Scotia, Alberta		
Less favored	.0± 1.9	Newfoundland, Prince Edward Island, New Brunswick,	Newfoundland, Prince Edward Island	Manitoba, Newfoundland, Prince Edward Island, Nova Scotia	Newfoundland, Prince Edward Island, Nova Scotia, Quebec, Alberta, Manitoba
	-2.0— 3.9	Manitoba, Saskatchewan	New Brunswick, Manitoba, Saskatchewan	New Brunswick	New Brunswick, Saskatchewan
	4.0— 5.9	British Columbia	Quebec, British Columbia	Saskatchewan	
	6.0— 7.9	Quebec		Alberta, British Columbia	British Columbia

Table 26 shows the proportion of funds that each province receives from the different granting sources. Researchers in Prince Edward Island, Manitoba, Quebec, and Ontario are relatively heavily dependent on U.S. funds; psychologists in the remaining provinces draw the bulk of their support from Canadian, mainly federal, sources. In Alberta, Ontario, Saskatchewan, and Quebec, provincial sources contribute approximately a fifth or more of all the support psychologists in these provinces receive.

British Columbia is the only province in which university funds are a factor of even minor importance in research support.

**Table 26.—Percentage of Total Amount Received in Each Province
Derived from Different Sources**
(Based on Annual Value of Current Grants)

Province	Fed.	Prov.	Univ.	Other	Percentage of support from all Canadian sources	Percentage of support from foreign sources (U.S. fed. except where noted)	Total Percentage	Total amount received in province
Newfoundland	100.0	—	—	—	100.0	—	100.0	(\$4,000)
Prince Edward Island.....	—	—	—	—	—	100.0	100.0	(\$834) ¹
Nova Scotia.....	80.6	3.1	2.5	3.2	89.4	10.6	100.0	(\$125,675)
New Brunswick..	100.0	—	—	—	100.0	—	100.0	(\$4,000)
Quebec.....	24.1	19.4	2.4	3.5	49.3	50.7 ²	100.0	(\$546,787) ²
Ontario.....	36.4	23.2	2.3	3.4	65.2	34.8 ³	100.0	(\$1,668,390) ³
Manitoba.....	26.5	6.5	2.4	0.0	35.4	64.6	100.0	(\$92,302)
Saskatchewan	70.4	21.1	0.0	8.5	100.0	—	100.0	(\$35,500)
Alberta.....	55.3	29.9	2.7	1.5	89.4	10.6 ⁴	100.0	(\$233,785) ⁴
British Columbia....	58.4	5.9	14.8	1.5	80.5	19.5	100.0	(\$102,424)

¹U.S. University

²Includes \$4,000 other foreign

³Includes \$300 U.S. Univ. and \$300 other foreign

⁴Includes \$200 other foreign

Helpful to an interpretation of the support distribution patterns is an examination of the proportions of PRI's in each province in relation to proportions of psychologists. Table 27 shows that Alberta, and to a lesser extent Nova Scotia and Ontario, have disproportionately high numbers of PRI's, compared with relative density of psychologists, whereas Quebec and Saskatchewan are disproportionately low. Comparing the distributions of funds with the proportions of PRI's in each province, the following changes in status become evident.

In relation to Canadian federal funds, Quebec's poor position becomes average when proportion of PRI's is used, instead of all psychologists, as a basis for evaluation. British Columbia, however, which has as many PRI's as would be expected on the basis of its density of psychologists, remains "underfunded". Saskatchewan's relative position is improved, largely because it has so few research investigators. Ontario and Nova Scotia continue to maintain above-average funding levels, since both have high ratios of investigators to psychologist populations. The slightly favored position of Alberta disappears, however, despite its very good ratio of PRI's to total respondents, suggesting that research investigators receive smaller average grants per investigator than in Ontario or Nova Scotia.¹

¹This is confirmed in Table A-6 (See Appendix 4).

Table 27.—Proportions of Respondents and of Principal Research Investigators in Each Province

Province	Percentage of respondents	Percentage of PRI's	Disparity between percentage PRI's and percentage respondents
			+ = favorable; - = unfavorable
Newfoundland.....	0.3	0.8	+0.5
Prince Edward Island.....	0.2	0.8	+0.6
Nova Scotia.....	3.2	5.6	+2.4
New Brunswick.....	2.2	0.8	-1.4
Quebec.....	19.2	13.2	-6.0
Ontario.....	46.5	48.8	+2.3
Manitoba.....	5.2	5.6	+0.4
Saskatchewan.....	4.7	1.2	-3.5
Alberta.....	8.8	13.6	+4.8
British Columbia.....	9.7	9.6	-0.1

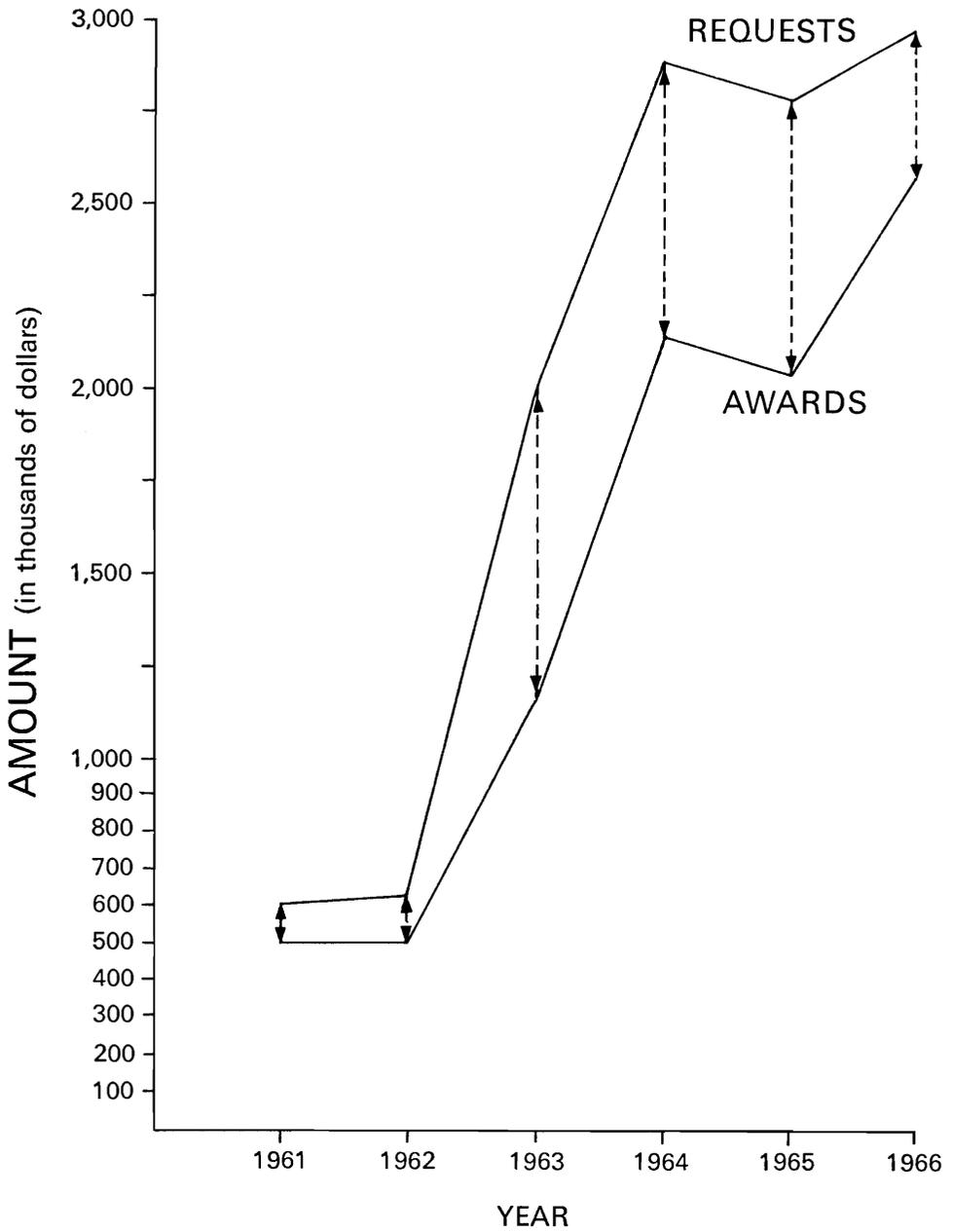
Comparing funding from all Canadian sources in relation to proportion of PRI's in each province, Ontario maintains its relative advantage, although the slight advantages of Nova Scotia and Alberta disappear. Quebec's situation is slightly improved, but that of British Columbia becomes worse.

U.S. (and other foreign) fund distribution, as a function of PRI proportion per province, is again highly favorable to Ontario and even more so to Quebec. Alberta, British Columbia, and Nova Scotia investigators are in least desirable relative positions in relation to non-Canadian funds.

Overall funding in relation to proportions of research investigators (as contrasted with total psychologist populations) is relatively better in both Ontario and Quebec than in the other provinces, with British Columbia, Alberta, and, to a lesser extent Manitoba having the lowest ratios of support to investigators.

There is little doubt that the individual characteristics of research projects and of investigators are of chief importance in accounting for the distributions of research funds. The discrepancies noted in levels of support in the various provinces in no way suggest that matters should be otherwise, but they do give rise to hypotheses as to why they do in fact exist.

One suggestion that has been made is that the unique position of Ontario, and in a somewhat different way of Quebec, can be attributed to the high proportion of U.S. funds (87.8%) awarded to psychologists in these two provinces, where the great majority of psychologists from the U.S. are concentrated. This is partly true, to the extent that U.S. funds contribute significantly, especially in Quebec, to the support of Canadian research. But the proportion of American psychologists in Alberta is higher than in any of the other provinces, whereas the proportion of U.S. funds, and of all funds, in Alberta is below the average of most other provinces.



GRANT REQUESTS AND AWARDS
(in thousands of dollars)
1961 - 1966

FIGURE 9

More reasonable explanations of the highly favorable position of Ontario *vis-a-vis* the other provinces may lie in the concentration of universities in that province (86.8% of PRI's are attached to universities), and the relative salience of provincial organizations that are sources of research funds.

Density of psychologist population in Ontario (and in Quebec) may be a further factor encouraging research and grant requests. One might conclude that concentration of psychologists in universities is a significant condition for stimulating research activity. If so, the likelihood that in the near future such concentrations will develop even more suggests that grant requests may well increase at a rate even greater than would be expected from the predicted increase in university staff (Chapter 3). What is being suggested is that there may be a "critical mass" in universities for the generation of research activity. When this is reached, a step-function increase in grant requests may be expected. Observation indeed suggests that this is the case; small departments do not appear to generate the level of interest in research that large departments do, for probably obvious reasons.

2.12 Research Grant Requests and Awards 1961-66

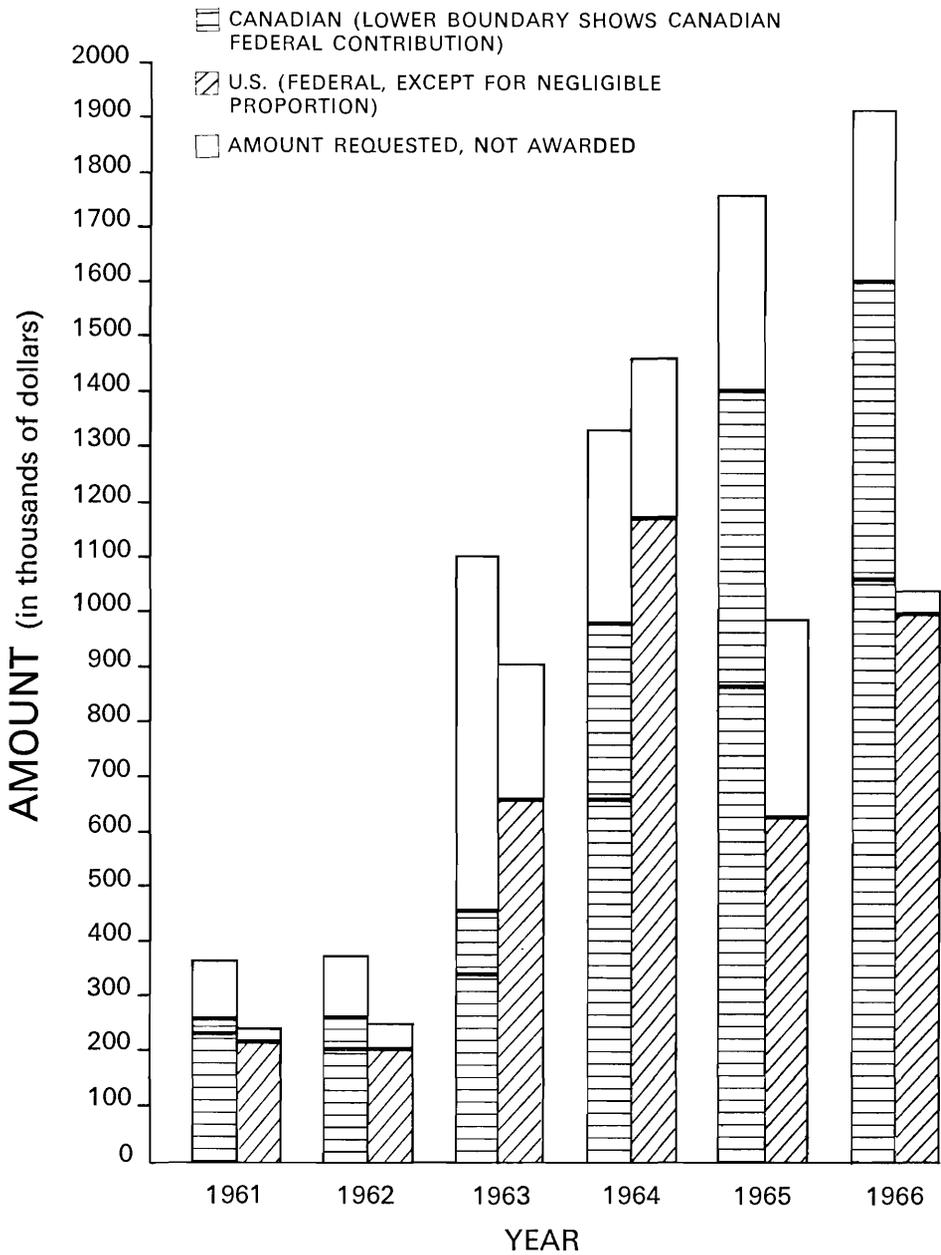
Over the period 1961-66 it is estimated that a total of approximately \$12 million¹ was requested for psychological research, of which just under \$9 million was awarded. Approximately \$5 million of the total \$9 million reported as received came from Canadian sources, including about \$3.5 million from the federal government, and approximately \$4 million from U.S. sources. (Table A-6, Appendix 4).

Over the six-year period studied there has been a more than fivefold increase in the total value of grants awarded, from approximately \$500,000 in 1961 to over \$2,500,000 in 1966². Figure 9 shows the value of grant requests and awards by year.

In addition to the very marked increases in both requests and awards, Figure 9 reveals one other notable fact, namely, the appearance of a sizeable disparity between requests and awards beginning in 1963. The sharp increase in grant requests in this year (reflecting the sudden upturn in university staff and the rise in the number of research psychologists in Canada) was not fully anticipated and the sizeable increase in awards fell far short of support needs. In the following three years further significant increases in awards brought their relation to requests back into better proportion. Figure 10, showing the amounts of Canadian and U.S. awards separately, reveals that in 1963 the disparity was especially sharp between requests to and awards from Canadian sources. The awards from Canadian sources totalled less than half the amount requested; the \$346,000 awarded by Canadian federal agencies was just over one-third of the \$971,000 requested.

¹ This estimate is conservative. Some 20% of investigators failed to report amounts requested along with amounts received. In these cases amount received was taken as amount requested. If an "average difference" were computed on the basis of those reporting full information and the correction added, this sum would be in excess of \$13 million.

² Since the amount awarded in 1962 was *less* than that for 1961, the increase can be said to have occurred in a five-year rather than a six-year period.



GRANT REQUESTS AND AWARDS
 (in thousands of dollars)
1961 - 1966, CANADIAN AND U.S. SOURCES

FIGURE 10

Grants from U.S. government sources ameliorated the situation in 1963, increasing threefold in amount over that of 1962. In 1963 and again in 1964 U.S. government sources contributed significantly more than all Canadian sources combined, providing nearly twice as much as Canadian federal agencies in each of the two years. However, the Canadian government also nearly doubled its awards in 1964, and in the next two years again significantly increased its support as did other Canadian sources; while U.S. awards decreased from their 1964 high. Thus in the past two years, for the first time in the period studied, Canadian support considerably outweighs that from the U.S. sources to Canadian investigators.

American support remains, however, a very salient feature in the picture of research financing of psychology in Canada. In 1966 the U.S. government contributed almost as much as Canadian federal sources (\$980,000 vs \$1,055,000), accounting for approximately 38% of the amount awarded. Any marked drop in support from this source—which has been heralded in U.S. policy statements and now seems to be taking place—would place considerable extra burden upon Canadian funds. For example, in 1966, the total amount requested from U.S. and Canadian sources together was close to \$3 million dollars, almost double the \$1.6 million met through Canadian sources.¹

Figure 11 plots the percentage of total grant awards contributed by Canadian sources and the U.S. government from 1962 to the present. It illustrates the apparent trend over these last five years for Canadian sources to increase their share of research financing, with a corresponding decrease in the proportionate U.S. contribution.

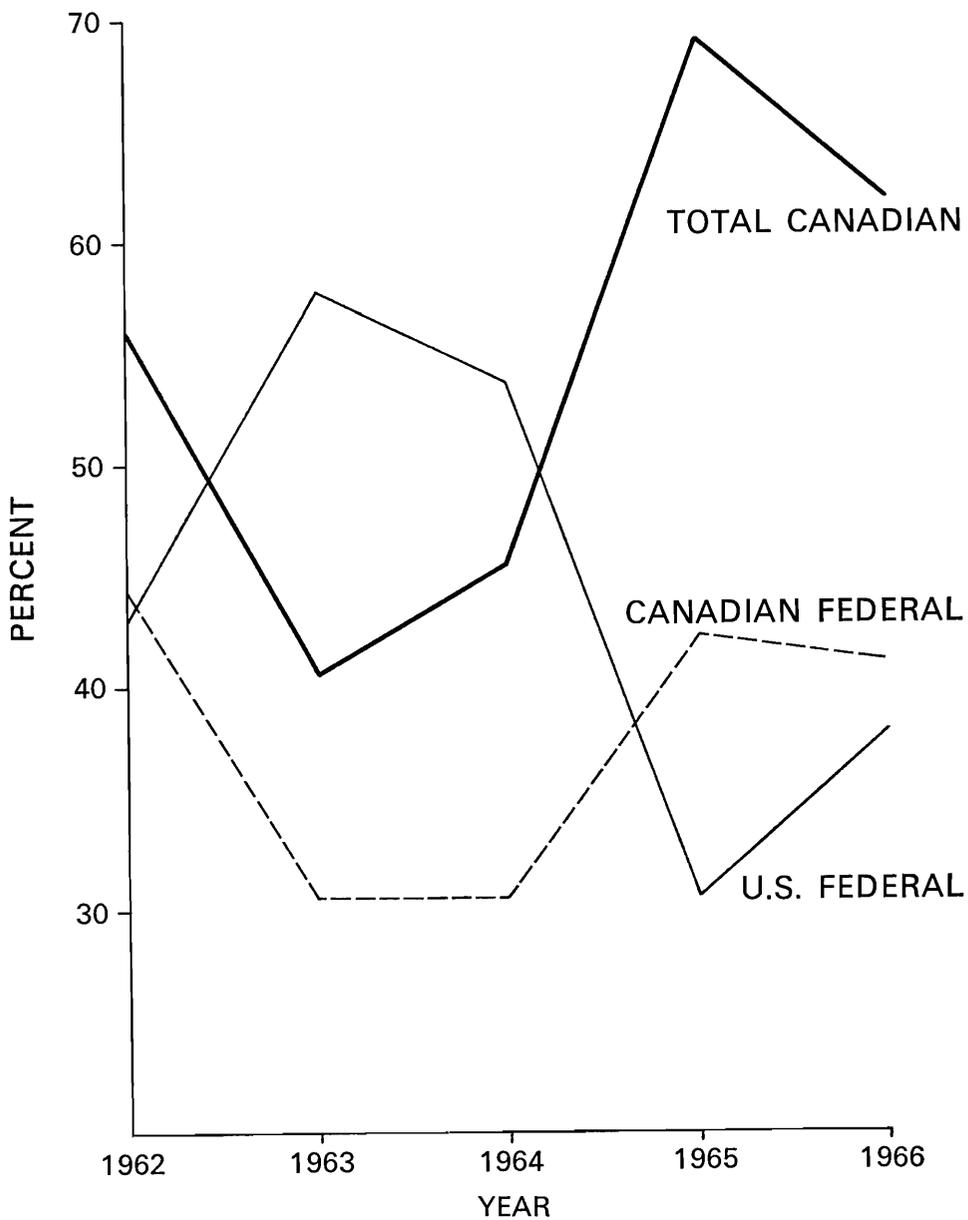
Some independent indication of the increase in Canadian federal grant support of psychological research from 1956-57 to 1966-67 was obtained from the (unpublished) "Reference List of Federal Grants in Support of Social and Behavioural Sciences" distributed in March of this year by The Interdepartmental Group on Behavioural and Social Sciences of the Defense Research Board. It reports on the grants and scholarships in support of activities in psychology, sociology, and anthropology. An analysis of data on psychology reported in this document reveals that the total support from the agencies listed² more than doubled from 1957 to 1961, increasing more than tenfold from 1957 to 1967 (from approximately \$100,000 for 1956-57 to about \$225,000 for 1960-61, to over \$1,200,000 for 1966-67).

The total amount awarded for the current year for psychological research, according to information in the document cited, is \$1,211,692, of which \$728,268, or just over 60% was contributed by the National Research Council. By 1966 NRC had increased its total contribution to psychological research more than tenfold over that for 1960 (from \$83,665 for 1960-61 to \$866,768 for 1966-67).³ The awards for the current year were more than double the total for the previous

¹ See earlier note (p. 55) regarding underestimations of amounts requested, and note (p. 34) regarding withdrawal of U.S. funds.

² The agencies for which grants were reported for 1956-57 are Department of Labour, DRB, DHW & NRC; for 1960-61 the same four, plus Canada Council; and for 1966-67 all of the preceding plus the Department of the Solicitor General.

³ Figures include scholarships and major equipment grants.



**PROPORTIONS OF TOTAL GRANT AMOUNT
AWARDED BY CANADIAN AND
U.S. SOURCES, 1962-66**

FIGURE 11

year, and that amount, in turn, was more than double the total for 1964-65. This grant acceleration began after 1963, when, as we noted earlier, grant requests to the government were double the total of awards that could be made.

Data from this source are consonant with the findings reported from our Research Financing Questionnaire, and confirm the conclusion that research support in psychology in Canada has reflected growth in the field in this decade. (Some symptoms of this growth are reported in Chapter 3.)

2.13 General Comment

The data reported in the preceding sections on research financing are, of course, derived from responses to the questionnaire and therefore are incomplete with respect to total value of research support.

It is estimated¹ that there are some 300 principal research investigators in psychology in Canada as of 1966. Of these 250 responded to the questionnaire, reporting awards amounting to \$2,813,697 for 1966-67. Of this amount, \$950,244 was attributed to the major Canadian federal sources included in the DRB "Reference List". The corresponding figure from the List was, as noted above, \$1,211,692, and thus it appears that 21.6% of the total is not accounted for in our figures.

Assuming that the proportion with respect to other sources is the same as that for this group (which accounts for a third of the \$2.81 million figure), we would estimate the total grant support for 1966-67 to be \$3,421,455, or, in round numbers, close to \$3.5 million dollars.

The difference between this figure and the \$2.8 million reported in the preceding section could be accounted for by two factors. First, are the non-respondent PRI's and the resulting missing grant amounts. An estimated 16.7% of PRI's did not return their questionnaires. Second, in calculating annual value from value reported (for grants extending over more than one year) we made the necessary assumption of equal distribution across time (Section 2.6). If annual amounts of awards on a given project tend to increase with successive years (as is noted in the Reference List) rather than remain constant, the additional 4.9% difference may be accounted for on this basis.

¹ Different operations produce different estimates, with a range from 275 to 325. The lower estimate is made on the basis of extrapolation from the sampling of non-respondents described in Appendix 3. The higher estimate derives from the number of grants reported by granting agencies (e.g., the DRB information cited above) in comparison with the number of respondents reporting support from those agencies.

Chapter 3

PSYCHOLOGY IN CANADIAN UNIVERSITIES

The data upon which this Chapter is based were supplied by the chairmen of all 33 departments of Canadian universities that offered undergraduate or graduate psychology programs in 1966¹. Included are numbers of current students and academic staff, predictions of enrolments and staff developments over the next decade, and information on other matters considered relevant to research financing five and ten years hence.

The general finding is that academic psychology is in the midst of a dramatic expansion that will continue for at least several years.

3.1 Undergraduate Students in Psychology

In 1966 a total of 1,337 baccalaureate awards in psychology were reported. This number is approximately double that for 1961. An increase of 125% is predicted by 1971 over the current number, and the expected further increase by 1976 over the 1971 figure is on the order of 32%. In the 10 years from 1966 to 1976 the number of baccalaureate awards is expected to increase threefold.

Although accurate figures were not always available, 31 of 33 chairmen reported that the proportion of the total undergraduate student population enrolled in psychology courses had increased over the last 10 years. Only one reported that the proportion had decreased.

3.2 Graduate Students in Psychology

There were 1,041 graduate students in Canadian university psychology departments in 1966, approximately three times as many as in 1961. According to the estimates of psychology department chairmen, the 1966 number will more than double by 1971 and will triple by 1976. Table 28 presents the data by province and university.

Table 28 shows that the greatest concentrations of psychology graduate students are in Ontario, Quebec, and Alberta. Ontario accounts for close to half (45.9%) of the total, Quebec has 22.9%, and Alberta 17.0%. The eight departments with 70 or more graduate students (Laval, McGill, Montreal, Ottawa, Waterloo, Western Ontario, and Alberta's two departments at Edmonton) are located in these three provinces, and together account for 61.0% of all 1966 graduate students.

By 1971, 16 of the 27 departments expect to enrol 70 or more graduate students, the mean number per department (38.5 for 1965-66) rising to 85.3

¹Including 31 departments of psychology and 2 departments of educational psychology.

Table 28.—Numbers of Graduate Students in Psychology in Canadian Universities

Province University	Actual			Predicted	
	1956	1961	1966	1971	1976
<i>Nova Scotia</i> : Acadia.....	1	1	0	10	20
Dalhousie.....	4	12	34	70	90
<i>New Brunswick</i> : New Brunswick.....	0	1	10	12	20
<i>Quebec</i> : Laval.....	0	7	70	230	250
McGill.....	—	48	70	125	150
Montreal.....	10	18	80	140	150
Sherbrooke.....	0	8	18	60	70
<i>Ontario</i> : Carleton.....	0	0	24	50	50
Laurentian.....	0	0	0	5	25
McMaster.....	0	0	38	38 ¹	38 ¹
Ottawa.....	50	75	95	150	200
Queen's.....	1	12	50	80	100
Toronto.....	60	54	47	125	150
Waterloo.....	0	0	93	225	250
Western Ont.....	6	14	70	125	150
Windsor.....	2	20	38	100	150
York.....	0	0	23	100	150
<i>Manitoba</i> : Manitoba.....	4	7	40	95	100
<i>Saskatchewan</i> : at Regina.....	0	0	15	50	80
at Saskatoon.....	2	8	9	25	35
<i>Alberta</i> : Calgary.....	0	0	14	60	60
Edmonton.....	0	30	79	130	150
Calgary (Ed).....	0	0	6	75	200
Edmonton (Psy.).....	2	—	78	78 ¹	78 ¹
<i>British Columbia</i> : British Columbia.....	20	25	38	70	100
Simon Fraser.....	0	0	2	50	90
Victoria.....	0	0	0	25	30
Totals ²	162	340	1,041	2,303	2,936

¹Current enrolments carried over as minimum estimate in absence of chairman's forecast in these cases.

²Bishops, Brandon, Guelph, Memorial, Mt. Allison and Sir George Williams report no graduate students and no present intention to enter graduate work in psychology. A number of new universities have been established but do not at present have undergraduate psychology majors.

by 1971 and to 108.7 by 1976. Barring unforeseen developments in new institutions, or serious change of intention of reporting institutions, Ontario will continue to be the largest center for graduate education in psychology, with Quebec and Alberta increasing proportionately.

Table 29 shows the relation of proportions of graduate students to population at large and the changes in relative proportions of students in the different provinces if predicted future enrolments materialize.

The proportion of graduate students being educated in Ontario is considerably in excess of that province's present percentage of the Canadian popula-

Table 29.—Numbers and Proportions of Graduate Students in Each Province

Province	Percentage Canadian population in province	Number and percentage of graduate students					
		1965 /66		1970 /71		1975 /76	
		(actual)	p.c.	(estimated) ¹	p.c.	(estimated) ¹	p.c.
Newfoundland.....	2.5	0	—	0	—	0	—
Prince Edward Island.....	0.6	0	—	0	—	0	—
Nova Scotia.....	3.9	34	3.3	80	3.5	110	3.8
New Brunswick.....	3.2	10	1.0	12	0.5	20	0.7
Quebec.....	28.9	238	22.9	555	24.1	620	21.1
Ontario.....	34.4	478	45.9	998	43.3	1,263	43.0
Manitoba.....	4.9	40	3.8	95	4.1	100	3.4
Saskatchewan.....	4.9	24	2.3	75	3.3	115	3.9
Alberta.....	7.4	177	17.0	343	14.9	488	16.6
British Columbia.....	9.1	40	3.8	145	6.3	220	7.5
Total.....	100.0	1,041	100	2,303	100	2,936	100

¹ By respective department chairmen.

tion. Although predicted to decline slightly over the next ten years, the proportion would remain higher than a population ratio would require. Alberta shows a similar pattern. Other provinces are, of necessity, below the ratio one might expect on the basis of population. In the decade ahead only British Columbia and Saskatchewan will appreciably improve their relative positions, but will not reach a level proportionate to population. A modest improvement in the proportion that obtains currently in Nova Scotia will bring it to an appropriate level by 1975.

Needless to say, these comparisons are highly speculative. The assumptions of equality of need and of opportunity across the provinces that would underlie such comparisons may not be valid at all, nor are expected population changes being considered.

Even if we discount the estimated enrolments, however, and deal with actual (1965-66) figures, it is apparent that Ontario and Alberta have considerably higher proportions of students to population than all other provinces combined.

No reliable data are available on proportions of out-of-province graduate psychology students attending the different universities.¹ It is nevertheless considered to be reasonably high. If so, the disproportionate contributions of Ontario and Alberta would create costs to these provinces that might be expected to be recovered either from other provinces directly or through federal government intervention. Out-of-state fees, common in many of the state universities in the U.S., might be another way of compensating universities and/or their provincial sponsors for extending training capacities to accommodate students from other jurisdictions.

In any case, the nearly threefold increase in graduate psychology enrolments expected in this next decade will bring with it significant increases in fund-

¹ Returns on student questionnaires were less than 60%, precluding meaningful analysis.

ing needs both for institutional and student support and for the expanded research programs that necessarily accompany growth of educational establishments.

Table 30 summarizes information on the current status of 190 students who received graduate degrees in 1966. Of these, 78 who earned master's degrees are currently pursuing doctoral studies and 4 who were awarded Ph.D.'s are now postdoctoral students. The whereabouts of 5 graduates were unknown to their chairmen. Of the remaining 103 graduands of 1966, 44.7% were reported as entering teaching and research positions and 55.3% service functions.

Table 30.—Current Status of 1966 Graduate Degree Awardees¹

Field Entered	Number awarded master's degrees	Number awarded doctorate	Total
Teaching.....	13	27	40
Research.....	5	1	6
Clinical /counselling.....	39	12	51
Testing.....	6	0	6
Total employed.....	63	40	103
Further study.....	78	4 ²	82
No information.....	3	2	5
Total.....	144	46	190

¹Based on reports from 13 departments of psychology (Alberta, Carleton, Dalhousie, McGill, McMaster, New Brunswick, Ottawa, Saskatchewan, Toronto, Waterloo, Western Ontario, Windsor).

²Post-doctoral study.

This division is not very different from the proportions currently found in the work force (see Chapter 2). Teaching and research, however, are somewhat more heavily favored, at the expense of service functions, by this new group than by those already in the work force in 1966. In parallel with the findings reported in Chapter 2, the teaching/research group is composed chiefly of persons with the doctorate (28 of the 46), whereas the service group consists mainly of persons with a master's degree (45 of the 59).

Of the 66 new psychologists with a master's degree, five or 7.6%, are now employed in the U.S. Of the 42 new psychologists with doctorates, 12, or 28.5% are now employed in the U.S., and one abroad. (No information is available to indicate whether this loss of over a quarter of new doctorates to the U.S. in 1966 has generally been the case in the past or is likely to be so in the future.)

3.3 Academic Staff in Psychology Departments

The growth predicted in both undergraduate and graduate student enrolments between 1966 and 1976 is paralleled by staff increases of a similar order predicted by the psychology department chairmen. Table 31 presents the actual numbers of faculty members for the academic years ending 1965, 1966, and 1967, with five and ten year projections from 1966.

Table 31.—Numbers of Full-Time Faculty Members or Equivalent in Canadian Universities¹

University	Actual			Predicted	
	1965	1966	1967	1971	1976
Newfoundland:					
Memorial.....	5	5	8	15	25
Nova Scotia:					
Acadia.....	3	3	4	6	10
Dalhousie.....	8	10	17	25	40
New Brunswick:					
Mt. Allison.....	3	3½	4	(8) ²	(8)
New Brunswick.....	5	6	8	(14)	(22)
Quebec:					
Bishops.....	2	3	4	(8)	(8)
Laval.....	16	16	18	27	(27)
McGill.....	23	28	29	33	38
Montreal.....	25	30	33	(40)	(40)
Sherbrooke.....	11	11	18	65	70
Sir G. Williams.....	15	15	(15)	(15)	(15)
Ontario:					
Carleton.....	10	12	17	23	27
Guelph.....	—	—	6	(6)	(6)
Laurentian.....	4	5½	8½	14½	16½
McMaster.....	10	13	14	(24)	(24)
Ottawa.....	20	20	21	(21)	(21)
Queen's.....	11	16	18½	25	30
Toronto.....	24	28	31	40	50
Waterloo.....	17	21½	22	57	(65)
Western Ont.....	17	22	26	38	50
Windsor.....	14	14	18	26	35
York.....	10	16	23	39	59
Manitoba:					
Brandon.....	3	4½	6	10	(10)
Manitoba.....	9	12	15	24	30
Saskatchewan:					
at Regina.....	4½	6	9	20	32
at Saskatoon.....	8½	9½	9½	18	(18)
Alberta:					
Calgary.....	8	10	13	26	49
Edmonton.....	16	20	24	38	50
Calgary (Ed.).....	8	10	13	26	49
Edmonton (Psy.).....	19	19	27	(40)	(40)
British Columbia:					
B.C.....	13	17	22	46	76
Simon Fraser.....	0	6	13	26	46
Victoria.....	6	8	11	17	24
Totals (33 departments).....	348	421	526	860	1,110

¹Figures may be slightly rounded, to avoid proliferation of fractions.

²Numbers in parentheses are carried over from the latest prior year for which an estimate was made. (The table abstracts from year-by-year estimates made by chairmen from 1968 through 1976.)

Once again we see that the 1971 figure is more than double that for 1966, and the 1976 figure almost triple.¹ Mean staff size in 1966 was 12.8 while in 1971 it is expected to be 26, rising to 33.6 by 1976.

These observations have two implications for research support needs: first, since the great majority of principal research investigators (86.8%) are in academic departments, predictions of their numbers are our best indication of the extent of future research and of financing requirements; and second, the expected growth in average size of the departments may, as discussed in Chapter 2 and above, lead to a greater amount of research activity than would be estimated on the basis of numbers alone. (Chapter 4 will deal further with this and other considerations pertinent to forecasting research support needs.)

Table 32 gives the numbers and proportions of academic staffs in each province and, for comparison, the percentage of Canadian psychologists in each of the provinces. Estimates for 1970-71 and 1975-76, and the corresponding distribution of proportions they generate, are also given.

Table 32.—Numbers and Proportions of Academic Staff in the Universities of Each Province

Province	Percentage of Canadian psychologists in province	1965/66 (actual)		1970/71 (estimated) ¹		1975/76 (estimated) ¹	
		No.	p.c.	No.	p.c.	No.	p.c.
Newfoundland.....	0.4	5	1.2	15	1.8	25	2.3
Prince Edward Island.....	0.2	0	0.0	0	0.0	0	0.0
Nova Scotia.....	3.0	13	3.1	31	3.6	50	4.5
New Brunswick.....	2.1	9½	2.3	22	2.6	30	2.7
Quebec.....	23.0	103	24.5	188	21.9	198	17.8
Ontario.....	43.5	168	39.9	313½	36.4	383½	34.5
Manitoba.....	5.4	16½	3.9	34	3.9	40	3.6
Saskatchewan.....	4.5	15½	3.7	38	4.4	50	4.5
Alberta.....	8.1	59	14.0	130	15.1	188	16.9
British Columbia.....	9.8	31	7.4	89	10.3	146	13.2
Total.....	100	421	100	860	100	1,110	100

¹by respective department chairmen

As other provinces increase their numbers of academic staff, the present heavy concentrations (64%) in Ontario and Quebec will be somewhat balanced, although Ontario, together with Quebec and Alberta, will continue to have the largest groupings of academic personnel in Canada for the foreseeable future.

¹Thirteen of the departments reporting failed to estimate staff numbers throughout the ten-year period, perhaps reflecting the cautiousness of chairmen in predicting continued rapid growth over too long a period. If this is the case and if therefore the levelling off of growth rate between 1971 and 1976 does not represent a true asymptote, the 1976 figure would be an underestimation.

Ontario and Quebec are expected to approximately double their present academic psychology staffs over the next decade; increases proportionately much larger will be taking place in the other provinces, ranging from a factor of 2.5 in Manitoba, to 4 in Nova Scotia, and 5 in Newfoundland and British Columbia.

Where these very large numbers of faculty will come from is a question. In 1963 Mandler¹ reported on estimated need for 200 new faculty members in Canadian universities in the period 1963-1968. His analysis suggested that at most 100 of these could be recruited from the doctoral graduates of Canadian universities. Staffs have been expanded at an even more rapid rate than was anticipated in 1963 and the proportion of new staff that can at present be supplied from the graduate schools themselves is considerably smaller than his estimate of 50%.

Our data reveal, for example, that the increase in academic staffs between 1965-66 and 1966-67 was 105 (Table 30), but the number of new Canadian doctorates entering teaching in the same year was only 27! Ultimately it is to be hoped that the increase in capacity will produce doctoral graduands in sufficient numbers to close this gap, but the likelihood that this can be done in the next few years seems slim indeed. (It should, of course, be kept in mind that new Ph.D.'s cannot immediately be turned to the task of training Ph.D.'s, but their entry into academic departments certainly would contribute, if only by releasing more experienced faculty time, to the education of graduate students.)

3.4 Faculty-Student Ratios

When numbers of staff in each university are compared with numbers of baccalaureate degrees awarded and with numbers of graduate students in psychology some rather large variations appear among institutions.² On the basis of the two criteria, the psychology department at Saskatchewan (Regina) has the most favorable ratios (1:0.8 for baccalaureate awards and 1:1 for graduate students). At the other extreme is Alberta (Edmonton) with ratios of 1:12.3 for baccalaureate awards and 1:4 for graduate students.

Near the center of the extremes on both criteria are McMaster, Montreal, and Queen's, with staff to baccalaureate award ratios from 1:1.5 to 1:2.3 and staff to graduate student ratios of 1:2.7 to 1:3.1.

British Columbia, New Brunswick, Toronto, and Windsor have relatively high numbers of baccalaureates awarded per staff member (5.5 to 6.5) and relatively low numbers of graduate students per staff member (1.7 to 2.7).

Dalhousie, Manitoba, and Waterloo show the opposite pattern: low numbers of baccalaureate awards per staff member (0.5 to 1.4), and fairly high numbers of graduate students per staff member (3.3 to 4.4).

Situations and programs vary considerably from university to university, and these comparisons may therefore be misleading in some cases. However, all of the ratios appear well within the range in which reasonably close faculty contact with, and supervision of, student work should be possible.

¹ Mandler, G. The problem of expansion and research financing in Canadian Departments of Psychology, 1963-1968. Unpublished report, Assoc. Comm. Exper. Psychol., NRC, Ottawa, Oct., 1963.

² In these comparisons only the fourteen universities are included that have both psychology undergraduate and graduate students and that have been awarding psychology degrees since at least 1961. The universities compared are: Alberta, B.C., Carleton, Dalhousie, Manitoba, McMaster, Montreal, New Brunswick, Queen's, Saskatchewan, Toronto, Waterloo, Western Ontario, and Windsor.

3.5 Graduate Student Support

Table 33 shows the sources and amounts of psychology graduate student support reported as currently available from university-mediated sources. Awards range from \$100 to \$5,000, with a median range from \$700 to \$1,800, depending on source. Approximately 80% of students currently receive support from these sources, although the levels are quite low (considering the fact that only 5% have tuition waived and tuition averages \$430).

Table 33.—Sources and Amounts of Graduate Student Support Mediated through Universities¹

Source ¹	Number awards reported	Percentage of awards	Range	Mean award	Mdn. award
Provincial grants.....	272	33.2	\$500-4,800	\$1,481	\$1,500
Research grants to staff.....	175	21.3	200-5,000	1,339	1,000
Univ. scholarship/fellowship.....	162	19.8	100-4,000	1,681	1,800
Employment in field agency.....	148	18.0	300-5,000	1,392	1,000
Other awards or employment through university ¹	63	7.7	500-4,000	1,363	700
Total ²	820	100.0	\$100-5,000	\$1,465	\$1,500

Percentage of graduate students supported: 81.2%³

¹Excludes awards made directly to students on basis of open competition (e.g., NRC, Canada Council, Woodrow Wilson, etc.).

²Mean graduate tuition reported was \$430. Only 51 or 5% received exemption from tuition. This number is not included in number of awards reported.

³As reported by chairmen. Calculating percentage from data here and in Table 28 yields 78.8%.

One third of graduate awards come from provincial sources; the Ontario Graduate Fellowship Program is the major contributor. However, the recent decisions of the Ontario Government to (1) ration the number of awards under a restricting quota system and (2) prohibit use of provincial funds to provide graduate scholarships within the Ontario universities, may have serious effects on the graduate support situation in the province with the largest number of graduate students. (These decisions affect all fields, of course, not just psychology.)

Table 34 shows the types of work assignments given graduate students in return for support received. Two thirds of the duties are directly involved with the teaching functions of the universities, while approximately one third are research assistantships. A negligible number of assignments are in non-academic training settings.

It can be assumed that all of the stipends provided through research grants to staff are research assistantships; this leaves some 10% of research assignments being supported in some other way.

Close to 80% of those receiving assistance are required to work for their support, constituting an estimated 64% of the graduate student population. This suggests that although considerable funds go to the ostensible purpose of under-

Table 34.—Graduate Student Work Assignments in Return for Support

Duties	Number	Percentage
Teaching classes.....	31	4.8
Discussion section leaders.....	67	10.3
Laboratory section leaders.....	51	7.8
Laboratory assistants.....	81	12.5
Grading of papers and examinations.....	189	29.1
Research assistants.....	203	31.2
Apprenticeship in field agency.....	22	3.4
Clerkship in field agency.....	4	0.6
Other.....	2	0.3
Total.....	650	100.0

Percentage of those students supported by university-mediated awards	79.3
Percentage of graduate student population	64.3
Average number of hours/week	= 11
Average number of months/year	= 8

writing graduate education, there is a direct return of service (over 7,000 man-hours per academic year) and of cash (over a quarter of the average award being returned in tuition).

Further, to the extent that required work is not always directly related to the student's career interests, an unknown extension of the length of each student's graduate career with its attendant costs is introduced. Clearly, a re-examination of the entire matter of graduate support, its cost to, and effects on, the system of graduate education as well as its benefits, would be worth undertaking.

The costs of building, equipping and staffing the expanding graduate programs across Canada have been admittedly high, and their continued development and maintenance in the face of growing need will be costly as well. At the same time, the high standards that have generally been maintained during this expansion have for the first time placed Canadian graduate schools in a position to attract large numbers of first quality students.¹

A number of the best students continue to be attracted outside Canada, however, and especially to the United States. Unless a fair share of the first class students can be kept in or attracted to, Canadian institutions, the whole new tone of their graduate development will begin to deteriorate. It would be most unfortunate if this happened for so relatively insignificant a reason as an unfavorable student stipend program.

In light of overall benefits, financial advantage currently lies with U.S. institutions in competition with Canadian universities for the good graduate students. There is no question that there would be takers of the smaller Canadian stipends and that expansion schedules will continue on time. However, such growth would not be healthy if it were based only on those students who could not successfully compete for the more attractive awards elsewhere.

¹ Of course, it is well known that a few Canadian institutions have, for many years, attracted small numbers of students. The opportunity here addressed is for providing a quality graduate education to numbers larger than had ever before been contemplated.

To the extent that student support is a contributing factor to the attractiveness of Canadian programs to prospective students, the *relative* cost of more generous stipend conditions is a minor consideration (in light of the overall costs of program operation) that might well make the difference between quality and ordinary programs.

3.6 Faculty Recruitment

Table 35 dealing with *senior* faculty (professors and associate professors) only, shows the heavy current dependence on the United States for members of this group.¹

Table 35.—Recruitment of Senior Faculty¹ (from Canada, U.S., and U.K., only)

	Country of Candidate			Total
	Canada	U.S.	U.K.	
Number interviewed.....	40	99	10	149
Number offered appointments.....	25	66	9	100
Number who accepted.....	8	23	3	34
Number who did <i>not</i> accept.....	17	43	6	66

Reasons remembered by chairmen for acceptances or refusals of senior posts:

Reason	Number of cases in which <i>more</i> favorable situation in Canada was cited as reason for acceptance	Number of cases in which <i>less</i> favorable situation in Canada was cited as reason for refusal
	Number	Number
Salary.....	29	11
Research financing.....	24	36
Research facilities.....	15	15
Retention of foreign research grant.....	20	31
Other benefits.....	18	40

¹Based on chairmen's reports

The appointment:refusal ratio suggests that the proportion of offers refused is about the same for persons recruited from Canada, the U.S. and the U.K., though the absolute number of people "lost" to the Canadian community is highest in the U.S. recruitment. (Normally, persons are interviewed only when considered seriously interested in taking a post.)

¹It is clear that the products of Canadian universities of earlier years are already well absorbed and that the new graduates cannot gain instant maturity and experience to provide the leadership needed.

Table 35 shows some of the reasons senior persons gave for accepting or rejecting offers from Canadian universities. Clearly the same criteria are attractive to some and unattractive to others. Concern about foreign grants can be interpreted three ways: we could suppose that those who saw this as a reason for accepting an offer either had no grants, had grant funds but were assured of their portability, or had guarantees of substitute funds for those they might jeopardize by moving.

The replies suggest the possibility that those who accept and those who refuse appointments constitute different populations of psychologists. Persons coming *for* higher salaries, better research financing or more adequate research facilities may all be from relatively deprived institutions or persons for some reason bypassed in their own universities, while those *refusing* appointments for the same reasons may be from more affluent or more adequate settings.¹ One would hesitate to suggest that we may be attracting relatively less able or attractive scholars and conversely unable to attract those more in demand elsewhere, but an examination of this possibility should not be avoided.

Needless to say, if 66% of those offered appointments decline to accept, some careful examination of the recruiting strategy as well as self-appraisal of institutions is warranted. Of course, the acceptance rates vary with institution, a factor that may provide a clue to where some of the difficulties may lie.

Estimates were presented earlier (Table 32) of the number of full-time faculty currently in and needed for academic departments over the next 10 years. As noted in that table, only minimum estimates are given, as some chairmen refused to second guess their administrations or fiscal authorities in estimating numbers they will be allowed to add to their staffs in future years. Nevertheless, a considerable annual increase is still needed, leveling somewhat only by the beginning of the next decade. To accomplish the required recruitment—especially of senior faculty—in light of known absolute scarcity, will require all the ingenuity and all the support department chairmen can muster. The obvious alternatives are (1) stop growth—a most unlikely possibility in light of increasing demands, (short of a decision on the part of universities to ignore needs and wants)—or (2) fill staff openings with less well trained and/or less experienced or less adequate people. This latter would be catastrophic, since the tenure tradition would entrench mediocrity for decades to come, dooming any possibility of developing a tradition of quality.

Table 36 confirms the fact that a very large fraction of the psychology faculties of Canadian universities, both senior and junior, is composed of non-Canadians (39 to 44%). Of these, the most significant proportion are Americans (25% of total in 1965-66, rising to 27% in 1966-67). As earlier noted, the total numbers may be expected to increase sizeably each year, and it is now quite clear that the proportion of non-Canadians will soon be in the majority.

Chauvinistic considerations aside, there would be no other possibility of coping with the increasing needs for faculty if recruiting of non-Canadians were to be curtailed. Indeed, it needs to be stepped up, at least for the next few years.

¹ Of the 43 U.S. citizens who declined appointments, 35 cited better research facilities elsewhere, 33 cited better research financing, 29 cited inability to retain a foreign grant, and 36 cited "other benefits". Only 9 cited salary.

Table 36.—Citizenship of University Psychology Department Faculty Members (Full-Time Faculty Only)

Country of Citizenship:	1965-66						1966-67	
	Professors and associate professors		Assistant professors and below		Total faculty		Total faculty	
	Number ¹	Per-centage	Number	Per-centage	Number	Per-centage	Number	Per-centage
Canada.....	116 (2)	59.5	139	62.6	255	61.1	279	55.7
U.S.....	49 (4)	25.1	56	25.2	105	25.2	136	27.1
U.K.....	15 (1)	7.7	10	4.5	25	6.0	38	7.6
Other Foreign.....	15 (2)	7.7	17	7.7	32	7.7	48	9.6
(Combined Non-Canadian).....	79 (7)	(40.5)	(83)	(37.4)	(162)	(38.9)	(222)	(44.3)
Total.....	195 (9)	100.0	222	100.0	417	100.0	501	100.0

¹Including Research Professors, the number reporting being shown in parentheses.

What is of concern is the increasing precariousness of the Canadian position. American psychologists are often reluctant to immigrate or remain in Canada permanently because of citizenship and other home ties and because they, together with Canadian and other non-Canadian psychologists, tend to view the United States as the base of the North American professional community.

Canadian departments have so far been extremely successful in attracting and holding foreign psychologists in fair number. However, any significant economic, political, or social change could tip the balance enough to have many decide to return to their own countries or, for non-U.S. citizens to immigrate to the U.S. where similar shortages, especially of senior persons, exist. This vulnerability of Canada is not unique to psychology, or to the professions generally. But it is of great importance insofar as the maintenance of thriving academic communities is concerned. Only through the increased production of Canadian psychologists by the universities can any degree of self-sufficiency be attained. It will require a generation, at least, if our figures are at all accurate, before Canadian psychology approaches this point.

3.7 Equipment and Facility Needs of Academic Departments

Table 37 presents chairmen's assessments of available and needed equipment and facilities. No attempt was made to assess dollar value of the items indicated, but a three point scale (inexpensive, moderate cost, expensive) was used. It is reasonably encouraging to see so many entries in the "available" side, as opposed to the "needed" side of the table. These undoubtedly reflect capital investments of the past five to ten years and suggest that a number of departments are capable of providing reasonably adequate support to their ongoing graduate pro-

Table 37.—Assessment by Department Chairmen of Psychological Research Facilities at Canadian Universities

Available			Equipment or facility in area of:	Needed		
Inexpensive	Moderate cost	Expensive		Inexpensive	Moderate cost	Expensive
5	10	9	Animal behavior study.....	—	7	4
4	9	5	Child study.....	3	6	3
4	10	5	Clinical study.....	—	5	4
4	10	8	Computer.....	—	2	7
7	15	1	Human behavior study.....	1	7	4
2	8	13	Physiological recording.....	—	6	6
1	6	4	Psychopharmacological/Biomedical.....	1	2	7
9	14	6	Sensory process.....	3	5	4
14	9	3	Social psychology, personality.....	—	6	5

grams.¹ Table 37 gives evidence of some self-limitation on the part of departments as to interest areas and level of need. Reflected in the distribution of equipment by areas is the predominance of experimental research, though desire for facilities for child study, clinical, personality and social study suggests some clear further aspirations in these directions.

3.8 General Comment

Department chairmen estimate psychology course enrolments at approximately 10% of *total* current undergraduate university student course enrolments. This figure suggests that departments have a reasonably large teaching obligation to students and programs in their institutions in excess of teaching commitments to undergraduate psychology majors and honors students and to their graduate programs. Undergraduate enrolments in psychology courses were reported by 32 of 33 chairmen to be on the increase. Expansion pressures are thus related not only to graduate or even undergraduate psychology student increase, but to “service teaching” as well.

Modal teaching loads reported are three courses plus an average of three theses being supervised and about five hours per week of committee work or other responsibility per faculty member. Such loads are seen by faculty members—especially by those engaged in research—as excessive, and the matter of teaching load becomes one of the factors that enters into the recruiting situation.

Approximately 60% of full-time faculty are reported to be engaged in research. A small fraction of these receive part of their salaries from grant sources, for a total of approximately \$220,000. In addition, some 15 to 20% of psychology faculty receive summer research stipends from their universities, of the order of \$1,000 each; while 5 to 10% receive summer income from research grants.

¹ New equipment developments and new techniques and approaches in psychology will unfortunately always require an amount of equipment “upgrading”, especially in the areas of psychophysiology and biomedical psychology, but in other areas as well.

In general, the academic psychology community in Canada is undergoing rapid expansion and development in all its aspects. Since the number of psychology doctorates being produced has not yet begun to approach the expansion rate of faculties (not to mention increasing needs for psychologists in the larger community), there is now and will continue to be, for a generation at least a significant dependence on American and other non-Canadian sources for doctoral-level persons for Canadian institutions. With approximately 40% of present psychology faculties being non-Canadians, and the proportion continuing to increase, some thought must be given to ways and means whereby Canadian institutions can continue to attract this essential group whose ties to Canada must, of necessity, be more tenuous than those of indigenous colleagues. The "brain-drain in reverse" has made the current necessary university expansion possible. It has at the same time made Canadian institutions more vulnerable. Unlike some other scientific and professional groups, psychologists are not readily available elsewhere in the world and must be drawn from the North American community. The need to remain competitive with American institutions to hold American psychologists on Canadian faculties is perhaps the clearest conclusion one can draw from the data at hand.

Chapter 4

FUTURE NEEDS FOR RESEARCH SUPPORT IN PSYCHOLOGY

In this Chapter we will attempt to forecast research support needs on the basis of the data and considerations that have been presented in the preceding chapters.

Forecasting is a precarious art at best. We engage in it here to meet the commitments we have accepted in undertaking this assignment, but in full awareness that unknown factors may affect the research situation in psychology in the period of concern. The academic or fiscal year 1965-66 will be taken as the focal year for a five-year forecast for 1970-71 and a ten-year prediction for 1975-76.

4.1 Predicted Growth in Numbers of Research Psychologists

The basic factor that will determine the extent of grant support needed is the number of independent PRI's who will remain in, or join, the Canadian psychological community. In turn, the base upon which their numbers can best be predicted is the estimated number of academic psychologists, for almost 90% of independent PRI's come from this population.

For the five years between 1965-66 and 1970-71 a doubling of academic staff has been predicted; and in ten years *minimum* estimates anticipate a more than 160% increase. If the same proportion of academic psychologists are PRI's in five and ten years, one would predict a 100,% and at least 160% increase, respectively, in the number of PRI's on this basis.

The predicted increase in graduate students over the same period—twofold in five years, nearly threefold in ten—suggests that the larger psychology work force is likely to about double in ten years from this source. It seems improbable that the number of psychologists outside university settings will increase at a slower rate than the number within. Barring any serious “brain drain,” and if the present trend to immigration is maintained, all indications are that there will continue to be a significant increase in both demand¹ and supply of psychologists for both service and teaching-research positions. As the slowly increasing supply of doctoral level persons from the graduate schools enter the work force, and particularly the “service” areas, one would expect an increase in the amount of research, and in the number of PRI's in such settings as well.

In summary, a most conservative estimate would be that the total number of psychologists in Canada will increase about 100% in five years and at least 160%

¹For example, a recent survey of manpower needs in Ontario (Berry, R. G., “Manpower needs in psychological services in Ontario 1965-1970.” *OPA Quarterly*, XVIII, Summer 1965, 45-76) indicated that there was a serious shortage of psychologists in spite of the larger per capita manpower pool.

in ten. These estimates will be used to provide the basic figures for our forecast of research support needs. The following provisos suggest, however, that those magnitudes may be underestimates:

- (a) there is reason to believe that department chairmen's predictions were overly cautious, especially for the ten-year period;
- (b) earlier predictions made in this decade of growth rates of academic staff have been found to be underestimates;¹
- (c) the proportion of academics who become PRI's may well increase as their absolute number increases and as the body of psychological research findings grows;
- (d) the proportion of "service" psychologists who become active researchers may well increase as a result of both professional and public pressures;
- (e) continued increase in doctoral level personnel (through immigration and training) should increase the proportion of RIP's and PRI's in the work force at large.

In light of these considerations a factor of 20% will be added to the 1970-71 figures to form an "adjusted base" to correct for underestimates of numbers of investigators. A factor of 40% will be added to the 1975-76 base figures for the same reason.

If we then start with an initial figure of \$3.37 million, assuming that the reported \$2.81 million annual value of current grants represents approximately 80% of the actual total (Section 2.13), we arrive at base figures of \$6.74 million for 1970-71 and \$8.76 million for 1975-76 by using the 100% and 160% accretion factors. These figures become \$7.41 million and \$10.11 million when the correction is made for underestimation of expected PRI increase. It is from these "adjusted base" figures that further estimates will be made.

Before presenting the total predicted research support needs, however, consideration must be given to other factors affecting our forecasts.

4.2 Customary Factors Affecting Financial Forecasts

In addition to the increase in numbers of research investigators, several other factors must be taken into account in forecasting needed support in five and ten years. Two of these are normal increases due to *cost escalation* and *equipment sophistication*.

The assumption is made in adjusting for equipment sophistication that over a five-year period refinement in research apparatus and data-processing equipment produces a 20% increase in cost. Thus the \$7.41 million estimated for 1970-71 is raised by 20% to \$8.89 million, and the \$10.11 million estimated for 1975-76 is increased by 40% to \$14.15 million.

It is also customary to assume a 25% increase over a five-year period due to dollar depreciation or increased cost of living. This means that the \$8.89 million

¹E.g., in 1962 a recruitment rate of 50 per year was expected to be achieved by 1970. (Ferguson, G. A., Financial aspects of psychological research in Canada, *Canadian Psychologist*, 1962, 3a: 82-87). Annual increases well beyond that number have already been in effect the last two years. See also Mandler, 1963, *op. cit.*)

estimated in 1965-66 becomes \$11.11 million at 1970-71 prices, and \$14.15 million estimated in 1965-66 becomes \$21.225 million in 1975-76.

If no other probable escalating factors are considered, we would conclude that \$11.11 million will be needed for support of psychological research by 1970, and \$21.225 million will be needed by 1975. (The conservativeness of these estimates is evident if we try a retrospective forecast. Applying the same reasoning to figures on research support in 1960-61—predicting the approximately 60% faculty increase that actually occurred over the next five years, and adjusting by 20% for equipment sophistication and by 25% for cost escalation—would have produced a forecast of approximately \$750,000 for support of psychological research in 1965-66. Actually, the level of support in 1965-66 was more than *four times* that amount.)

4.3 Implications of Expected Reduction in U.S. Government Support

It is important to consider that Canadian sources are likely to be called upon to contribute very high proportions of the total \$11 million and \$21 million plus that will be needed five and ten years hence. At present, approximately one third of total grant support comes from U.S. sources. U.S. policies imply that this contribution will diminish markedly and rapidly in the near future; there is evidence that the threatened withdrawal of funds has begun. Since only negligible support is obtained from private or other non-Canadian sources, it seems clear that the entire burden of meeting predicted needs will devolve on Canadian governmental granting sources. Thus, whereas according to the current proportions, Canadian government sources could expect requests on the order of close to two thirds of the total in 1970, they will likely face requests amounting to five sixths of the total¹, or approximately \$9.26 million. And by 1975 they may be the *sole source* for the entire \$21.225 million that will be needed by then.

If the Canadian, and especially Canadian federal, sources are not prepared to guarantee support of projects currently being underwritten by U.S. funds, should these funds be withdrawn, the result might well be the loss of highly productive psychologists now being supported in this way.²

4.4 Other Factors Pertinent to Forecasts of Psychological Research Support Needs

It has been indicated that there are certain features of Canadian federal granting policies that make them less desirable than grants from other sources. One is the matter of direct compensation to the principal investigator (e.g., by means of summer research stipends). Other things being equal, one relatively attractive feature of U.S. government grants, as compared with Canadian government grants, is the inclusion in the former of a stipend provision. This difference has been an important factor in the academic recruiting situation (Chapter 3).

¹ It is here assumed that the U.S. funds would be reduced by half their present proportion rather than entirely eliminated by 1970, but this reduction may be larger. For the ten year estimate, however, the safer forecasting assumption is that funds from this source will not longer be available.

² Not a large number of persons is involved. The one third of total support covers fewer than 15% of PRI's, but these are persons of high reputation and excellent research productivity and the effect of their possible loss to the Canadian psychological community if support of their research is interrupted would be disproportionate to their numbers.

There is some indication that summer stipends may be reintroduced as allowable factors in Canadian grants (they already are from some Canadian sources—e.g., CMHC, CCURR) as the university presidents withdraw their earlier opposition to such a practice. Certainly this change can be expected in the next five years if not sooner.

For forecasting purposes it would be well to include a factor to allow for this expected development by 1970. An estimated 15% is being added, therefore, to the five year forecast and 30% for 1975-76.

In the matter of “overhead” we must expect a change in the next five-year period. Canadian universities have been accustomed to assume the costs of space, ancillary equipment, clerical assistance, professional consulting services, maintenance, etc., as well as the investigator’s time, but the increasing financial crises of the universities (and their improved cost accounting methods) make it unlikely that they will be able or willing to bear the costs much longer. As the amount of research in the universities increases and demands on university facilities also rise, overhead requirements will surely increase and, within the forecast period, have to be met.¹

A reasonably conservative estimate of overhead charges would be an assessment of 20% of the total cost of research in 1970-71. Assuming that this will be a rapidly accelerating factor (of necessity), an assessment of 40% of total costs by 1975-76 seems appropriate for forecasting purposes.

An additional factor that may increase the cost of research is the growing trend to employ full-time technicians on research projects. This practice, traditional in the field of medicine and in many of the other sciences, is only now coming into use in psychology with the increased size and scope and technical sophistication of much of psychological research. That experienced professional assistants could considerably improve the efficiency of the research enterprise has long been understood. However, academic investigators have, for a number of reasons, felt obliged to use (and support) graduate student assistants instead. Such “forced marriages” of faculty research persons needing assistance and students needing support are often rationalized in terms of training and in some cases serve both partners admirably. More and more, however, research investigators are turning to the use of technicians for the continuing work of research laboratories and using student assistants, in addition, only when funds allow.

It seems reasonable to assume that this trend will continue and that budgetary “divorce” of technician and student support should be explicitly made. Conceivably, the wide employment of full-time technicians could result in the more efficient accomplishment of research objectives and the reduction in research costs. It is as likely, however, that any savings in time would be used to increase the scope of research and the quality of findings. Thus, for forecasting purposes, we would include an estimate of 15% to take account of the increased use of technicians on research projects in five years, and 30% as a forecast of the cost of this addition in ten years.

¹See Bladen, V. W., Dugal, L. P. *et al.* *Financing higher education in Canada*. Assoc. of Univ. and Colleges of Canada, Ottawa, 1965.

These additional factors are pertinent chiefly to university-based research but not entirely so. Equivalent features (e.g., student "internships", overhead and special research staffs) could be expected to develop in non-academic settings and, if the experience in the U.S. and U.K. provides any guide, a proportion of the institutionally supported research will present itself for independent grant support and will not be denied.

Thus, although one would reduce the above estimated additions by some 10 to 15% of their amounts on the basis that the proportion of PRI's in university settings is only 86.8% of the total, we will not do so on the grounds cited above.

A related further likelihood, for which an added factor of 15% and 30% for the two projections will be calculated, is that universities will, in addition to requiring that overhead or indirect costs be added to grants, begin to take closer account of and sharply reduce the subsidies they now provide research programs in the way of free telephone, stationery, postage, library materials, and the myriad of other ways investigators have assumed they could draw on university resources.

Table 38 presents a summary of the forecast of research financing needs for five and ten years hence, taking account of all factors here described.

Table 38—Forecasts of Psychological Research Financing Costs

1. Current amount (1965/66) \$3.37 million

Additions due to

	1970/71		1975/76	
	Factor	Amount (in millions)	Factor	Amount (in millions)
2. Increase in no. of PRI's ²	100%	\$3.37	160%	\$5.39
<i>Adjusted base</i>		6.74		8.76
3. Correction for under estimation ¹	20%	.67	40%	1.35
<i>Adjusted base</i>		7.41		10.11
4. Equipment sophistication ²	20%	1.48	40%	4.04
5. Overhead compensation ¹	20%	.67	40%	1.35
6. Summer stipend to PRI's ²	15%	1.11	30%	3.03
7. Increased use of technicians ¹	15%	.51	30%	1.01
8. Replacement for university subsidies ¹ ...	15%	.51	30%	1.01
<i>Sub-totals</i>		\$11.69		\$20.55
9. Cost escalation (% of sub-totals).....	25%	2.92	50%	10.275
TOTALS FORECAST FOR	1970/71	\$14.61	1975/76	\$30.825

¹Percent of current amount

²Percent of adjusted base

4.5 General Comment

It is difficult to say if the prediction of \$11.11 million needed for support of psychological research in 1970 and \$21.225 million in 1975 made earlier (Section 4.2) is a more accurate forecast than the totals of \$14.61 million and

\$30.825 million, respectively, reached in the expanded forecast of the preceding section. The answer will depend on the extent to which the additional factors discussed are in fact realized. They have been included in order to make the forecasts as accurate as possible in the light of discernible present trends.

The fact that a significant proportion of current PRI's are immigrants is another uncertainty. Were the apparent trend to immigration to continue or increase, the predicted number of PRI's five and ten years hence could still be an under-estimate, despite the adjusted base amount. On the contrary, were the immigration to slow down or stop, or were appreciable numbers of immigrants to leave Canada, the basic figures could themselves be overestimates.

The number of imponderables is so great that the implied growth in research needs on the order of 300% over the next five years and more than doubled again over the succeeding five years could turn out to be either gross over-estimations or gross under-estimations.

Finally, although these may seem to be very large increases, the facts are that (1) support levels in the immediate *past* five years *have* increased by 500%; (2) the growth rate of support for psychological research has been disproportionately increasing in the U.S. and the U.K.; (3) a research psychologist in Canada is on the average less well supported than his counterpart in the U.S.; (4) the proportion of all research funds awarded for research in psychology is still very small in Canada; and (5) many other pressures will be put upon Canadian funds, including at least partial withdrawal of U.S. funds.

Those responsible for this report believe that it is essential to the continuing vigor of the psychological enterprise in Canada that there be continued substantial growth in research support. It is also very desirable, for the sake of stability, that an increased proportion of the funding be from Canadian sources.

Chapter 5

SUMMARY AND CONCLUSIONS

A few summary statements will be attempted to answer in outline the questions posed at the initiation of the study reported here.

Canada's psychologists number 1,600, distributed relatively scantily in Quebec, the Atlantic Provinces, and Territories; more densely in the provinces west of Ontario; and most heavily in Ontario. But even in Ontario their present number in relation to population is low in comparison with the U.S. ratios.

Amongst scientists, psychologists as a group have a higher than average educational level; 40% are holders of doctorates, another 45% hold master's degrees. By comparison, 67% of U.S. psychologists hold doctorates. In spite of this difference in educational level for psychologists generally between the two countries, research and teaching psychologists in Canada are on a par with those in the U.S.

Clinical and counselling psychologists are most disparate in educational attainment with their U.S. counterparts. The median level in the U.S. is the doctorate, whereas only a quarter of Canada's psychologists in these functions hold that degree.

The level of educational attainment in Canada's psychological community is raised by its immigrant group (a fifth of the total). Most of these are doctoral-level people. Half the doctoral group are university-based, where over 80% hold doctorates, compared with less than a third in health and welfare settings. Two thirds of the doctoral group are involved in research, and 40% of them are directors of independent grant-supported research projects. Less than half of the doctoral group were professionally trained in Canada; half of the research and teaching doctoral group were trained in the U.S.

Over half of Canada's psychologists are in "service" positions,¹ a third are in teaching and research positions. The ratio of these two general sorts of functions is approximately 3:2 in the population studied. Immigrants (mostly U.S. citizens) comprise a third of the teaching and research group. Most of the immigrant group are recent arrivals to Canada.

Half of Canada's psychologists are engaged in research. A quarter are directors of research projects (300 principal investigators of independent grant-supported research, plus an estimated 100 directors of intramurally funded research). Ninety percent of the Principal Research Investigators are university-based; conversely, half the university psychologists are PRI's.

Half the research projects are in the major area of experimental, physiological and comparative psychology; another quarter are in the area of clinical psychology. The experimental field receives half the extramural grants, while intramural funds

¹ (clinical and counselling practice and other consulting, testing and personnel work)

are most concentrated in industrial and educational psychology. Clinical psychology and allied fields are disadvantaged in relation to both types of sources when proportions of investigators are taken into account.

The 300 PRI's are almost 90% at the doctoral level, 35% immigrants (especially from the U.S.), and mostly U.S. trained. They receive approximately \$3.5 million in grant support—somewhat over a third from the Canadian government, another third from the U.S. government. Both Canadian and U.S. government grants to psychologists in Canada have increased over 350% in the last five years. Grant support from all sources for Canadian research in psychology has increased fivefold in the five-year period preceding the survey. Still, annual grant support per psychologist in Canada is only \$835, considerably below the level of support enjoyed by psychologists in the U.S. (\$4,900). U.S. grants to psychologists in Canada are nearly three times the average value of Canadian government grants (\$20,700 vs \$7,100), reflecting Canadian policies, which disallow direct compensation to the researcher and allow only minimal overhead compensation, if any, to the host institution.

In addition to the \$3.5 million in grant support, a similar amount is contributed to psychological research by employing institutions. The latter funds go mainly (9:1) to “applied” research projects, whereas most of the government and other extramural funds are awarded for basic research (4:1). “Applied” research is better supported, in terms of mean value per project, although support is given to a larger number of basic research projects than to applied research projects. Both Canadian and U.S. governments support basic psychological research in Canada much more heavily than they do applied research (80% vs 20% of total amounts contributed). Ninety percent of support for basic psychological research in Canada comes from the Canadian and U.S. government sources combined, only 10% from other sources.

Great increases in the number of psychologists in Canada are expected in the near future, in line with recent and current growth patterns. The 1965-66 number of graduate students in psychology in Canada (over a thousand) is expected to double by 1970, and to triple by 1975. Correspondingly, the 1965-66 number on academic psychology faculties (over 400) will *double* by 1970, and nearly *triple* by 1975. Despite the expected increase in available graduates, it is estimated that the need for psychological service personnel is likely to outstrip supply for some years to come.¹

The 1965-66 number of psychologists engaged in research is likely to *double* by 1970, and *at least triple* by 1975. A conservative estimate of PRI's is 600 by 1970 (double the 1965-66 number) and 780 by 1975.

Research funds, which increased 500% in the five-year period preceding the survey, should increase over 300% from current figures by 1970 and double again by 1975 to meet anticipated needs (Table 38). If the recent trend toward proportionately greater contribution by Canadian government sources continues, especially in view of probable curtailment of U.S. funds to psychologists in Canada, assumption of responsibility for the research requirements forecast will

¹ Berry, R. G. 1965, *op. cit.*

mean that probably 5/6 of the total funds needed will be requested from Canadian government sources by 1970, and all of them by 1975.

The data suggested several problems for psychology in Canada:

- (1) the need to improve the ratio of psychologists to population;
- (2) the need to keep Canadian students in Canadian universities for their graduate training and to attract immigrant students to quality programs in Canada as a means of recruitment into the work force;
- (3) the desirability of improving the educational level of those providing psychological services and of improving the research position of these psychologists;
- (4) the continuing need for recruitment of doctoral personnel from other countries, especially the U.S.;
- (5) the consequent need to compete with U.S. academic institutions in terms of improved research financing, reduced teaching loads, and other factors;
- (6) the continuing need for more psychologists than are available (about 15% work on an overtime basis in addition to their principal employment);
- (7) the manpower costs implied in a possible under-use of service capacities and a heavy commitment to necessary administrative duties;
- (8) the importance of maintaining the unique role of government in support of basic research;
- (9) the need for increased and continuing support and facilities for a greatly expanding body of academic psychologists and psychology students if any of the other needs are to be met.

Appendices

APPENDIX 1

Canadian Psychological Association and Department of Citizenship and Immigration (Manpower): Professional Manpower Survey, 1966.

English or French version available on request from the Canadian Psychological Association, 225 Lisgar St., Ottawa, Ont.

APPENDIX 2

Questionnaire to Chairmen of Departments of Psychology in Canada.
Available on request from the Canadian Psychological Association.

APPENDIX 3

Conduct of the Survey

In the spring of 1966 the Professional Manpower Survey Questionnaire for psychologists was developed jointly by members of the Research Branch staff of the Department of Manpower and Immigration under the direction of Mr. Pankhurst and the writers after consultation with the members of the Research Financing Committee of the Canadian Psychological Association.

During the time that the questionnaire was being constructed and printed (both English and French language forms were prepared) attempts were made to develop a master list of names of psychologists from as many sources as possible. Membership lists were supplied by the Canadian Psychological Association and by provincial and regional psychology associations. The American Psychological Association contributed the names of its members residing in Canada. These, along with Provincial lists of registered psychologists and university psychology faculty lists—taken from the current survey report by Rev. R. C. Fehr of the Committee—comprised the basic mailing list of psychologists.

All persons on the list were sent a bilingual stamped reply card on which they were asked to confirm their address and to select the English or the French form. The questionnaires were accordingly mailed in June.*

During the summer attempts were made to expand the basic list with additional names supplied by heads of agencies employing psychologists. Sample enquiries were made of all types of agencies that were considered possible employers of psychologists, and more thorough coverage of a given type of agency was carried out when positive responses were received from any. Central offices were contacted in preference to local. Central university offices and extra-psychology university departments were also queried in order to identify psychologists outside of psychology departments. All enquiries asked for identification of persons employed in any psychological capacity. In addition, a form was enclosed with each questionnaire, requesting the respondent to give the names and addresses of any psychologists known to him who might not yet be on our list derived from professional association membership, registries, and faculty lists.

Altogether 475 names were added by these means to the original mailing list of 1,845 names. (Ultimately the master list was substantially reduced after duplications, post office returns, foreign residence, and disclaimers of status as a

*Earlier mailing would have been desirable for the sake particularly of contacting university faculty and graduate students at a more auspicious time, but was not possible. In consequence, percentage of return from faculty was somewhat lower than overall percentage return, and the poor response from graduate students made their data unusable: replies were received from 520 only, or 57.5% of 904 graduate students (named by department chairmen) to whom the questionnaire was also mailed.

psychologist were taken into account.) Questionnaires were mailed during the summer to the newly identified psychologists.

At spaced intervals, follow-up letters were sent to non-respondents (identified periodically by the Manpower Research Branch in Ottawa), and there was a second general mailing of questionnaires the first week in September to all who had not yet returned them.

Survey forms and correspondence in French were prepared from the English by Dr. Bélanger.

Questionnaires were marked "Confidential" and return envelopes were addressed to the Federal Department of Citizenship and Immigration (Manpower) where, respondents were assured, information would be coded and forwarded anonymously to York University for analysis. This procedure was considered desirable in order to assure respondents that income and other "personal" information would not become known on an individual basis to fellow psychologists. (It turned out to be most inconvenient and led to considerable lost time in completing the survey and data analyses.)

The coded data were keypunched, verified, and tabulated in the Computer Sciences Centre at York University for a Preliminary Report of findings based on returns through mid-October and submitted to the Science Secretariat in November 1966. Subsequently later returns were processed and the tabulations were verified for a final report, submitted in June, 1967. The present publication is a revision of the June report and a supplementary report (Part 2) submitted in July, 1967.

The Research Financing Committee of the CPA met in December to discuss the Preliminary Report prepared by the present authors, and members of the Committee present undertook specific tasks to improve upon it: Dr. Myers sent and reported on a brief second questionnaire to Psychology Department Chairmen seeking some additional points of information and verification of certain data submitted on the chairman's questionnaire which had been mailed in the previous spring. Mr. Boyd undertook to compare some of the survey findings with available United States data and Mr. Berry supplied comparisons with data on Ontario psychologists which he had gathered in 1965. Dr. Agnew supervised a follow-up telephone sampling of non-respondents to ascertain whether or not the non-respondents were appropriately included on our list and to test for possible bias in certain basic data in the report. On the latter point, extrapolation from his approximately 10% sample gave no evidence of bias in the original sample. Concurrently, Dr. Bélanger sampled the non-respondents in Quebec and reported on that population, without, again, producing evidence of any need for qualifying the conclusions reached in the report.

Data obtained from graduate students were disregarded for the present study, both because of the low rate of return and because much of the essential information required was available from the Psychology Department Chairmen. Information on foreign residents and on the inactive group (housewives and retired psychologists) was also not considered useful for drawing conclusions relevant to this report. Both groups were few in number and probably represent biased samples by virtue of their continued affiliation with the professional associations.

The report is accordingly based upon the returns of 1,323 respondents, and refers to a presumed total of 1,598 employed psychologists in Canada. The return on this group is thus a very satisfactory 82.8%.

Assessments of the data from special viewpoints within the field of psychology, prepared by certain members of the Research Financing Committee of the CPA, are included as Part 2 of the study.

APPENDIX 4

Tables

Table A-1.—States and Provinces Grouped According to Ratios of Psychologists to Populations

Number of Psychologists per 100,000 Population	Canadian Provinces and Territories (from Table 1)	U.S. States and Territories ¹
0.0–2.9	Newfoundland, P.E.I. and Yukon	Arkansas, Puerto Rico, South Carolina
3.0–5.9	New Brunswick	Alabama, Alaska, Georgia, Idaho, Kentucky, Louisiana, Mississippi, Montana, Oklahoma, South Dakota, West Virginia
6.0–8.9	Nova Scotia, Quebec, Saskatchewan, British Columbia	Florida, Indiana, Maine, Missouri, New Hampshire, New Mexico, North Carolina, North Dakota, Tennessee, Texas, Virginia
9–11	Ontario, Manitoba, Alberta	Hawaii, Iowa, Michigan, Nebraska, Nevada, Ohio, Rhode Island, Vermont, Washington, Wisconsin, Wyoming
12–14		Arizona, Illinois, Kansas, Minnesota, New Jersey, Oregon, Pennsylvania, Utah
15–17		Colorado, Connecticut, Maryland
18–20		California, Delaware, Massachusetts
24.0–27.9		New York
94.4		District of Columbia

¹U.S. numbers of psychologists from 1966 APA Directory. Population figures from 1965 census estimate (Courtesy U.S. Consulate, Toronto).

Note. (section 1.3) APA figures account for fewer than 80% of U.S. psychologists. Hence the numbers of U.S. psychologists per 100,000 population are actually considerably higher than this table indicates.

Table A-2.—Country of Post-Master's Education and Principal Function

Principal Function	Canada	U.S.	U.K.	Other	Total	Percentage Canadian Trained	Percentage Foreign Trained
Clinical.....	29	15	3	4	51	56.9	43.1
Counselling.....	11	8	0	2	21	52.4	47.0
Consulting.....	12	5	2	0	19	63.2	36.8
Computer/Statistics.....	1	0	0	1	2	50.0	50.0
Testing.....	32	4	6	5	47	68.1	31.9
Personnel.....	7	7	0	0	14	50.0	50.0
Research.....	38	51	11	5	105	36.2	63.8
Teaching							
—Psychology.....	66	77	19	6	168	39.3	60.7
—Other.....	6	10	1	2	19	31.6	68.4
Writing.....	0	3	1	0	4	0.0	100.0
Administration.....	80	40	6	1	127	63.0	47.0
Other.....	5	0	0	0	5	100.0	0.0
No Response.....	44	27	6	10	87	50.6	49.4
Total.....	311	247	55	36	649	58.9	41.1
Percent.....	47.9	38.1	8.5	5.5	100.0		

Table A-3.—Total Value of Grants Current in 1966: Amounts per Specialty

	Number	Value
<i>Clinical Psychology</i>		
Behavior problems.....	5	32,341
Community mental health.....	1	1,250
Crime and delinquency.....	2	5,000
Experimental psychopathology.....	13	104,796
Mental deficiency.....	3	7,347
Objective tests.....	1	8,000
Speech pathology.....	2	14,547
Other and not further specified.....	8	51,170
<i>Counseling and Guidance</i>		
Rehabilitation.....	1	14,250
Vocational counseling.....	1	4,150
<i>Developmental Psychology</i>		
Childhood and adolescence.....	11	154,035
Infancy.....	7	40,969
Maturity and old age.....	3	44,500
Other.....	2	6,889
<i>Educational Psychology</i>		
Educational measurement.....	5	23,300
Programed learning.....	1	7,000
School learning.....	7	35,424
Special education.....	1	76,667
Teacher personnel.....	2	9,000
Other.....	1	6,000
<i>Industrial and Personnel Psychology</i>		
Employee and executive training and development.....	1	12,000
Employee morale and attitudes.....	4	104,300
Job analysis and position classification.....	1	1,000
Market research, advertising.....	1	35,000
Organizational behavior.....	2	65,000
Recruiting, selection, placement.....	1	1,700
Safety research and training.....	1	4,000
<i>Personality</i>		
Development.....	1	3,000
Measurement.....	2	14,900
Personality and learning.....	2	6,200
Personality and perception.....	1	1,000
Other.....	1	800
<i>School Psychology</i>		
School Psychology.....	1	4,000
<i>Social Psychology</i>		
Attitudes.....	6	31,230
Cultural deprivation.....	2	40,830
Culture and personality.....	2	11,100
Group interaction.....	8	47,025
Social perception.....	4	5,300
Symbolic communication.....	1	37,000
Other.....	9	71,889

Table A-3.—Total Value of Grants Current in 1966: Amounts per Specialty—(Conc.)

	Number	Value
<i>Social Problems, Social Disorganization</i>		
Criminology.....	2	11,700
Poverty and dependence.....	1	18,000
Social conflict and accommodation.....	1	1,500
Other.....	1	10,000
<i>Experimental, Comparative and Physiological Psychology</i>		
Animal behavior.....	10	90,041
Animal learning.....	27	249,680
Apparatus design and evaluation.....	2	19,303
Audition.....	3	21,630
Autonomic functions.....	1	27,220
CNS functions.....	29	186,480
Communications research, information theory.....	3	13,900
Electroencephalography.....	5	164,167
Human learning.....	32	134,818
Motivation.....	13	156,955
Motor skills.....	3	15,200
Perception.....	30	253,438
Psychophysics.....	8	33,590
Sensory processes.....	6	114,550
Symbolic processes, problem solving.....	5	20,750
Vision.....	5	16,000
Other and not further specified.....	9	147,702
<i>Psychometrics</i>		
Factor analysis.....	2	7,010
Test construction, validation.....	2	10,360
Test theory, scale analysis.....	1	1,200
<i>Statistics</i>	2	3,100
<i>Pharmacology</i>		
Psychopharmacology.....	7	75,074
<i>Psycholinguistics</i>	1	5,000
<i>Psychology, other</i>	2	9,656
<i>Interdisciplinary</i>	3	72,000
<i>Other than Psychology</i>	1	650
<i>Unclassified</i>	10	150,000

Table A-4.—Educational Attainment of Work Force in Each Functional Category

Principal Function	Doctoral degree	Post-masters study	Masters degree	Total with advanced degree	Post graduate study	Bachelors degree	No response	Total
Clinical.....	39	12	46	(97)	5	3	0	105
Counselling.....	12	9	48	(69)	10	5	0	84
Consulting.....	15	4	15	(34)	—	—	1	35
Computer/Statistics	1	1	5	(7)	—	—	0	7
Testing.....	28	19	126	(173)	17	25	0	215
Personnel.....	13	1	16	(30)	2	5	0	37
Research.....	95	10	25	(130)	4	14	0	148
Teaching								
—Psychology.....	152	16	26	(194)	6	—	1	201
—Other.....	14	5	9	(28)	4	3	0	35
Writing.....	4	—	3	(7)	—	—	1	8
Administration.....	87	20	57	(164)	10	15	1	190
Other.....	3	2	7	(12)	1	12	1	26
No Response.....	64	23	98	(185)	14	28	5	232
Total.....	527	122	481	(1,130)	73	110	10	1,323

Table A-5.—Annual Value of Current Grants Received by Psychologists in Each Province

Province	Canadian				Total Canadian	U.S.	Total
	Federal	Provincial	University	Other			
Newfoundland.....	\$ 4,000	—	—	—	\$ 4,000	—	\$ 4,000
Prince Edward Island.....	—	—	—	—	—	834	834
Nova Scotia.....	101,245	3,950	3,120	4,000	112,315	13,360	125,675
New Brunswick.....	4,000	—	—	—	4,000	—	4,000
Quebec.....	131,870	105,893	13,000	18,900	269,663	277,124	546,787
Ontario.....	606,912	386,275	38,925	56,293	1,088,405	579,985	1,668,390
Manitoba.....	24,435	6,000	2,200	—	32,635	59,667	92,302
Saskatchewan.....	25,000	7,500	—	3,000	35,500	—	35,500
Alberta.....	129,385	69,850	6,350	3,500	209,085	24,700	233,785
British Columbia.....	59,779	6,000	15,145	1,500	82,424	20,000	102,424
Yukon/North West Territories.....	—	—	—	—	—	—	—
Total.....	\$1,086,626	\$585,468	\$78,740	\$87,193	\$1,838,027	\$975,670	\$2,813,697

1U.S. Federal Government sources except for approximately \$4,500.

Table A-6.—Distribution of Grant Funds by Province in Relation to Number of Psychologists and Number of Principal Research Investigators in Each Province
(Based on Annual Value of Grants Reported Current in 1966)

Province	Annual Value of Grants		Mean Amount / Psychologist		Mean Amount /PRI		
	from Canadian federal sources only	from all sources combined	from Canadian federal sources	from all sources	number PRI's	from Canadian federal sources	from all sources
Newfoundland.....	\$ 4,000	\$ 4,000	\$ 1,000	\$ 1,000	2	\$ 2,000	\$ 2,000
Prince Edward Island.....	—	834	—	278	2	—	417
Nova Scotia.....	101,245	125,675	2,411	2,992	14	7,232	8,977
New Brunswick.....	4,000	4,000	138	138	2	2,000	2,000
Quebec.....	131,870	546,787	519	2,153	33	3,996	16,569
Ontario.....	606,912	1,668,390	987	2,713	122	4,975	13,675
Manitoba.....	24,435	92,302	354	1,338	14	1,745	6,593
Saskatchewan.....	25,000	35,500	403	573	3	8,333	11,833
Alberta.....	129,385	233,785	1,106	1,998	34	3,805	6,876
British Columbia.....	59,779	102,424	467	800	24	2,491	4,268

Table A-7.—Summary of Psychology Research Grant Requests and Awards 1961-66
(thousands of dollars)

	1961		1962		1963		1964		1965		1966		Total 1961-1966	
	Req.	Award	Req.	Award										
<i>Canadian Source</i>														
Federal.....	327	235	308	212	971	346	900	655	1149	866	1277	1055	4932	3369
Provincial.....	19	19	48	33	68	56	280	188	432	381	481	431	1328	1108
Universities.....	6	5	6	6	18	17	19	12	60	43	56	44	165	127
Miscellaneous.....	13	5	14	13	44	38	126	119	120	105	97	70	414	350
Total Canadian.....	365	264	376	264	1101	457	1325	974	1761	1395	1911	1600	6839	4954
Percentage of grand total.....	60.1	53.8	59.4	55.7	54.4	40.3	47.5	45.3	63.6	68.2	64.8	61.9	58.1	55.8
<i>U.S.</i>														
Federal.....	234	219	249	202	898	654	1440	1154	971	617	1028	980	4820	3826
Other.....	5	5	5	5	8	8	18	16	5	5	3	1	44	40
Total U.S.....	239	224	254	207	906	662	1458	1170	976	622	1031	981	4864	3866
Percentage of grand total.....	39.4	45.6	40.1	43.7	44.7	58.3	52.2	54.4	35.2	30.4	35.0	37.9	41.3	43.5
Other Foreign & International.....	3	3	3	3	18	16	8	7	34	28	7	4	73	61
Percentage of grand total.....	0.5	0.6	0.5	0.6	0.9	1.4	0.3	0.3	1.2	1.4	0.2	0.2	0.6	0.7
Grand total.....	607	491	633	474	2025	1135	2791	2151	2771	2045	2949	2585	11,776	8,881
Total Percentage.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Part 2

IMPLICATIONS FOR FIELDS OF PSYCHOLOGY

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INTRODUCTION

It was recognized at the time the present study was planned that conclusions drawn from the findings of the *Study* would have general applicability to Canadian psychology but that by virtue of the wide scope of psychologists' interests and activities there would be need for further interpretation from the more focussed perspectives of particular sub-fields. Part 2 of the *Study* contains these analyses.

We asked a number of senior members of the psychological community to examine the *Study* carefully from the point of view of a special sub-field or focus and to write a statement of "Implications" for that particular area. To protect both writer and reader from individual bias in interpretation, a second (and sometimes a third) senior psychologist was asked to read and to either extend or modify each of the statements of implications where felt necessary. Here then, are six articles that focus attention on the implications of the *Study* for some nine sub-fields of psychology and separately for academic psychology and the unique situation of psychology in French Canada. Professor David Bélanger of the University of Montreal, (past-President of the Canadian Psychological Association) who undertook the preparation of the last-mentioned of these statements, was kind enough to provide both French and English versions, and both have been included. We express our thanks to him for this courtesy.

We are grateful also to Professor C. Roger Myers of the University of Toronto, Professor Gilles A. Auclair of the University of Montreal, Professors J. N. McK. Agnew and W. H. Coons of York University and Professor Arthur J. B. Hough of the University of Alberta for their reviews of the statements composing sections 1, 2, 3 and 4 of this Supplement. Authorship of the statements themselves is separately indicated and we here acknowledge our gratitude to the authors for the care and thoughtfulness of their remarks and for their cooperation in preparing them within the short time allowed.

M. H. A.

J. R.

ACADEMIC PSYCHOLOGY

The detailed statistical picture of academic psychology provided in the body of the *Study* clearly shows very rapid growth over the past few years and the necessity for continued growth. It is evident that undergraduate and graduate enrolments in psychology will continue to increase at a rate more rapid, perhaps, than increases in other disciplines. To meet this need alone, departments will have to maintain vigorous recruiting programs that will produce the need for supporting facilities, including, most importantly, research funds.

It requires no special argument to support the view that academic psychology must continue to grow for at least the next decade. It is rather less obvious, however, what the optimum rate of growth should be and the level, in terms of number of psychologists per thousand of population, that we should attempt to achieve.

The first temptation, and the one perhaps to which we should yield, is to accept the United States statistics as reflecting the desirable situation and set as our objective the achievement of a ratio of psychologists to population equal to theirs. There is no reason to believe that requirements for psychological services and research in Canada are any less than in the United States, or that there is a surplus of psychologists in the latter country. If we take the American ratio as an immediate objective, then according to the *Study* we must aim to double the number of psychologists in Canada through recruitment outside the country and through very substantial increases in graduate training facilities in Canadian departments.

Before going into the particulars of what will be involved in accomplishing this, another major implication of the statistical data in the *Study* needs to be stated since it bears on the nature of the desirable growth within academic departments. This has to do with psychologists in non-academic or service settings. Unquestionably the number of psychologists in the country is incapable of meeting the service need. It is also clear that compared with their counterparts in the United States, and with psychologists in academic departments in Canada, they are undertrained. In Canada only 27% of psychologists in the clinical and counselling areas are Ph.D.'s, compared with 60% in the U.S. Some 80% of psychologists in Canadian academic departments have the Ph.D. degree. Apparently training facilities in applied psychology are inadequate in Canada and this must be a matter of concern to academic departments.

At present the academic departments are heavily research oriented and have substantial financial support from outside the universities. They have already large and growing undergraduate and graduate teaching commitments, they are actively recruiting in order to meet their commitments, and are expanding their facilities to accommodate enlarged programs.

The difficulties faced by academic departments in maintaining the recently gained momentum are due to the fact that psychology is a North American discipline and Canadian departments must compete with those in the United States for needed personnel. It will be some years before we can graduate a sufficient number of Ph.D.'s to staff our own departments.

At present almost 40% of academic psychologists are non-Canadian and of these, two thirds are Americans. Further, some 27% of Canadian psychologists received their doctoral-level education in the United States. These percentages should decrease over the next few years as graduate students now in course in Canadian departments complete their studies and are absorbed, in part at least, into academic positions. This pending pool of personnel must, of course, be competed for against United States institutions and our success will be determined by

the opportunities we make available. The retention of existing faculty members, especially the American citizens, also depends on making comparable opportunities available.

The three major considerations that influence a man's decision to join any university department are salary, teaching load, and research facilities and support. It is probably true that Canadian departments compete least effectively with those in the United States in providing assurance of research support. Although the amounts of money available from Canadian sources have increased substantially in recent years it is still true (1966) that approximately one-third of operating funds come from American agencies. It now seems certain that these funds will be less readily available than in the past and indeed are likely to be radically curtailed. Also the average size of grant held by a Canadian psychologist is only one fifth of that held by a psychologist in the United States.

These facts put Canadian departments at a disadvantage when they attempt to recruit first-rate people from the United States. The remedy lies in substantially increased funds for psychological research.

Conclusions

Experimental psychology in Canada has, over the last decade, shown vigorous development and now occupies an important place in the scientific community. Because of psychology's uniquely North American character, continued Canadian development will require improved research financing, in particular, to keep competitive with United States institutions.

Applied psychology has not shown the same growth and academic departments must be concerned with this fact. Perhaps the scientific base should be established first but it would appear that the time has arrived, at least in the major Canadian departments, for a serious effort to train psychologists to meet the substantial community needs for psychological services.

P. L. NEWBIGGING.

BUSINESS AND INDUSTRIAL PSYCHOLOGY

Those concerned with industrial psychology in Canada have for long been acutely aware of a lag in its development. The situation is pointed up by the array of unfilled employment vacancies, and, for one part of Canada, by the Ontario Psychological Association's survey of manpower and training needs¹. The present *Study* does nothing to dispel these impressions and adds as a further dimension a basis of comparison with the situation in the United States.

Employment Characteristics of Psychologists in Canadian Business and Industry

One general conclusion is that Canada is greatly understaffed by comparison with the United States. When we consider the particular functions performed by psychologists in business and industrial settings, as depicted in Table 16, several

¹ Berry, R. G. 1965, *op. cit.*

other points emerge. It is notable that 8 (9.4%) report administration as their field of work, a proportion matched only by government service. This contrasts sharply with the overall administrator percentage of 2.4%. If, however, one adds those classified as "Directors" in Table 16 to the Administration group (20.6%), which seems reasonable, the overall percentage becomes 4.4. Research Institutes then show the highest proportion in administration but the proportion in business and industry is still relatively high. Thus the suggestion in the *Study* (p. 83) that there are "manpower costs implied in a possible underuse of service capacities and a heavy commitment to necessary administrative duties" is clearly applicable to the Business and Industry group.

The very small number describing themselves as consultants suggests that this group is under-represented in the respondents.

Engineering psychology provides a sharp contrast between Canada and the U.S. Only one respondent (0.1%) in the Canadian survey is classified in this field, against 377 (2.2%) in the U.S. (Compton, 1966). The one Canadian is employed by government; in the U.S. 60% of engineering psychologists are in Business and Industry and they comprise 17% of that group.

The very large proportion (61%) falling in the category of "Industrial Personnel" results in sharp restrictions on interpretation. It may be observed, however, that psychological roles in business and industry have only recently begun to be differentiated to an appreciable extent. It might be conjectured that the 57 respondents included in this broad category embrace, not only those easily recognizable as psychologists, but many who would view themselves primarily as personnel workers with a psychological emphasis in their education. The corresponding U.S. figure of 51% suggests the possibility that a parallel situation exists there, but to a lesser extent. However, lack of familiarity with the U.S. scene makes this even more of a conjecture. Whether or not such a situation is to be regretted could be judged only on the basis of a full account of the extent to which such persons use their psychological education in their work.

Level of Education of Canada's Industrial Psychologists

Judging by the proportion holding doctorates (10.6%) the Business and Industry group is the least well trained of all, being the lowest of all groups and far below the overall proportion (41.5%).

This may, in part, be attributable to the observation already made that many with a psychological background do not clearly identify with psychology as a profession, and may consequently regard education at the master's or even the bachelor's level as quite appropriate to the nature of their immediate duties and career aspirations.

These conjectures, however, lead to further ones regarding the influence of available education on the direction of careers. The fact is that almost no specialized training in industrial psychology has been available in Canada. The student interested in the field and who essays graduate training, is likely to become discouraged by the remoteness of his studies from his focus of interest. The extreme view found in some academic circles that sound scientific training is sufficient to enable

translation into application sounds rather hollow, particularly in view of the paucity of examples of such translation on the part of those who expound this view. Add to this the absence of recognized field settings to supply supervised experience and the student's dilemma is apparent. He must choose between switching to another field of interest, emigrating for further training, or struggling along with inadequate training. Anecdotal evidence supports these conjectures. In brief, there is a great need for the creation of graduate training programs in industrial psychology.

Research

Relative to the general level of financial support for psychological research in Canada, industrial psychology fares well. In Table 20, \$410,000 is identified with "Business Management" and an additional \$453,000 with "Industrial-Personnel" areas. Together these account for nearly a quarter of all employer-supported research. Grant-supported research in the "Industrial-Personnel" area amounts to \$223,000 (Table A-3, Appendix 4). These figures add to over one million dollars, representing about one seventh of the current Canadian total. With under 7% of Canadian psychologists in business and industry, research in this area appears to be relatively very well supported.

Before accepting such a conclusion, however, it is necessary to consider the nature of the research. Unfortunately, in the absence of sufficient detail, such consideration must be largely impressionistic. One clue is provided in Table A-3, Appendix 4, where it is shown that close to one half of the grant support for industrial and personnel psychology goes to "employee morale and attitudes". It is likely that an even larger proportion of employer-supported research in business and industry would be so classified. Moreover, it is highly probable that, particularly in the case of the employer-supported research, much is what might be termed "diagnostic surveys of particular conditions", providing little or no basis for generalization. Similarly, research in "recruiting, selection, placement" accounts for a small amount of grant support but probably a much larger proportion of employer support. Table 20 also reveals that little or no funds have been allocated for basic research in industrial psychology. This strongly suggests that governmental and other institutions providing basic research funds have not been supporting research in this area.

Admittedly this attempt to interpret the statistics is somewhat speculative but it gains support from the observed deficits in the research product. These deficits are immediately apparent in Canadian dependence on research done in other countries, mainly the United States. The research familiar to business and industry in Canada on such matters as leadership, management, organization, group behavior, and adaptation to change is almost wholly imported. Insofar as there has been application of such findings, cultural differences have been largely ignored. A striking but by no means inclusive example is the widespread use in Canada of United States test norms.

These comments are, of course, not meant to criticize the importation of research findings, but only to deplore the inertia that prompts their use without

testing their applicability. Furthermore, importation implies an obligation to export or exchange findings, and it would be unfortunate if Canadian psychologists in any field were content merely with the adaptation of others' research and failed to make reciprocal contributions.

Research in industrial psychology has tended to serve short-term and segmented goals. For example, we have found ways to improve selection or training for a specific job without due attention to the long-term effects on the individual selected and trained, or to the social and other contexts in which the job was to be performed. Such efforts are, of course, wasted when the specific job disappears, leaving the individual obsolescent.

From the point of view of the scientific community, or in terms of national aims, such research must be rated as inconsequential. When we consider the dominant role of business and industry in society, and the importance of work in the life space of the individual, we must conclude that something more significant is called for from industrial psychology.

If industrial psychology is to function effectively, it must gain an overall perspective, and there is no good reason why Canadian psychologists should wait for others to forward this work. As a starting point, it might be well to recognize that the business manager's function is to relate technology to human values.

Technological change is a familiar theme, but in the realm of values it is often assumed that business and industry operate on a one-value basis, the profit motive. However, the day has passed when the entrepreneur-owner single-handedly imposed his system of values on the enterprise. Now a much larger group, including managers, non-managerial employees (whether organized or not), customers, and the general public exert discernible pressure as never before. Profit is no longer a sole basis for evaluating a business organization. Only by taking cognizance of these other factors can sound criteria be established. Otherwise our research is in danger of retarding the adaptation of business to the modern world.

If it is correct to say that the values of many others impinge on the business enterprise and affect its adjustment in society, it becomes important for management to be aware of the changing value systems. In two important respects, it is suggested, values have changed relative to business and industry. To a much larger extent than heretofore business and industry are expected to contribute significantly to society, and at the same time to enhance the importance of the individual, i.e., all individuals within its purview, not just the competitive winners.

The manager needs research to alert him to the expectations of society on the one hand, and of the members of his organization on the other, and to elucidate the conditions necessary to achieve a balanced support of these values. Such an orientation, backed by research knowledge, will affect the kinds of products offered, the design of work roles and careers, the form of organization, and the distribution of power. It would be directed to converting technological change from a social problem to a means of enhancing developmental opportunity. It may not be too much to suggest that it might have significant impact on society as a whole.

Such a broad-gauged orientation is unlikely to be supported by a single business independently, but many would be willing to give support to cross-company research, provided it had a focus of integration related to practical considerations. Such a focus is needed in each of our larger centers in the form of an applied research institute or a strong applied group housed within a university psychology department. In addition to doing research itself within a variety of work institutions, such an institute or group could stimulate in-company research, influence its direction, and encourage better communication regarding research. Thus the amount of research would increase, its quality would be raised, and its cumulative effectiveness increased many fold.

J. B. BOYD

CLINICAL, COUNSELLING, AND REHABILITATION PSYCHOLOGY

Attention has been focussed in recent years on the need to improve and develop facilities in health, mental health, rehabilitation, and counselling fields in order to provide an adequate level of service to the people of Canada. Reports, based on surveys and studies carried out, have unequivocally stressed significant shortages of manpower, including psychologists, in service fields. Ontario, which presently has the most favorable ratio of psychologists to population, is critically short of personnel in the clinical, counselling, and rehabilitation areas. The demand for psychologists in community services has risen dramatically over the past dozen years as it has become increasingly evident that psychologists can make significant contribution to programs concerned with alleviating disability or developing human potential.

In addition, psychologists have made a number of important discoveries, principally in the area of learning, that have significant implications for clinical, counselling, and rehabilitation services. If these and future discoveries are to be utilized most effectively in the provision of services, it is essential that there be a sufficient number of qualified, well-trained psychologists available to apply the knowledge psychology is accumulating about human behavior.

In Canada there does not seem to have been (until quite recently) an awareness of the need for psychological staff or psychological services.¹ Consequently there has been less concern about and support for training² and salary levels have been lower. As a result, fewer people have entered the profession. The growing disparity between community needs and the number of psychologists available will now be difficult to overcome.

The present *Study* provides evidence that psychology as a whole has grown more slowly in Canada than in the United States. (Tables 1 and A-1). Despite

¹ For example, psychology is not among the essential services in the *Standards for Accreditation of Canadian Mental Hospitals* laid down by the Canadian Council on Hospital Accreditation in 1964. In contrast, the American Psychiatric Association in its *Standards for Hospitals and Clinics* issued in 1956, listed psychology as an essential service.

² The Canadian Psychological Association was unable to obtain financial support from Government for the recent Conference on Professional Psychology held at Couchiching in 1965.

the fact that more than 50% of those in psychology have service as a principal work function, shortage of service staff is acute. The rate of expansion of community services is curtailed as a result.

Moreover, clinical, counselling, and rehabilitation fields are staffed with less-well-trained personnel (Fig. 3); salaries are lower (Table 10); and the proportions of research grants are smaller. (Chap. 2, Sections 4 and 9).

The qualifications of staff, their selection and decisions about salaries and working conditions are all within the power of the employing agency to establish. The *Study* indicates quite clearly that the working conditions have not been sufficiently attractive to interest the best people with the inescapable consequence of lower standards of service and ineffective utilization of personnel. Under these circumstances it is perhaps not surprising that psychological services are not considered essential in some settings. However, the burgeoning demand for qualified staff indicates that this attitude is rapidly changing.

Despite this generally negative picture, there appear to be some positive aspects to the present situation if resources are properly utilized.

(1) There is still an untapped pool of manpower comprising those capable of, but not pursuing, a course of post-secondary education. It is from this pool that the great increase in undergraduate and, eventually, graduate enrolment is to come. Universities must cope with increased enrolments due to population increase and must be prepared, also, to handle a substantial per capita expansion of student population. The *Study* provides information on the need for academic staff. Psychologists now working in service settings will have to be utilized to provide training and supervision for the large numbers of psychologists who must be prepared to work in community service.

The per capita difference between Canada and the United States is an indication of the potential growth of the psychological manpower pool if training resources for both facilities and student support are available.

(2) The possibility of increasing the level of training and qualifications of those now in clinical, counselling, and rehabilitation services certainly merits consideration, especially in light of the youthfulness of the staff in these services. This would not only raise the standard of service but should also provide a cadre of persons able to train and supervise recruits who will have to be developed if staffing is to be improved.

(3) A more equitable distribution of staff should be sought by developing attractive working conditions which, for qualified psychologists, obviously must include the availability of research grants for applied projects. The high concentration of psychologists in urban centers can be changed only by developing significant opportunities for service and professional satisfactions in other areas.

With attractive working conditions there seems no reason why a "reverse brain drain" could not be effected to increase available manpower in clinical, counselling, and rehabilitation services. While there are marked differences from state to state and province to province, the mode of operation, concept of service, and requirements for training are essentially similar. It should not be difficult for psychologists to move across provincial, state, and national borders.

Even if all the psychologists needed to establish per capita parity between the two countries were to be recruited from the United States, it would represent a loss in manpower of only 10% to that country. The greatest proportion of the world's psychologists reside in the United States. Thus essential manpower for service, and particularly for training service personnel, will have to come from that market if needs are to be met.

In general, the requirements for developing training, research, and service facilities are the same in the areas of clinical, counselling, and rehabilitation as they are in other areas of psychology. It would appear that the development of these facilities is progressing but will require substantial financial aid, and strong support from those working in the field who will be called upon to assist in the training of new staff. The need should stimulate the development of new programs of training. It should be possible to improvise and to maintain a sufficiently flexible approach to training and service that unique programs will receive a trial.

The over-riding consideration must be to find the most effective manner in which the knowledge and techniques that psychology has to offer can be brought to bear on the human problems in these fields.

R. G. BERRY

EDUCATIONAL AND SCHOOL PSYCHOLOGY

Educational and school psychology form an integral part of the science and profession of psychology as a whole. Therefore the *Study* and the general implications that have been drawn from it apply directly to them. The comments to follow highlight certain data from the *Study* and add some observations that may have particular relevance for psychology as practised in school-oriented settings.

The General Areas of Educational and School Psychology

For purposes of this statement, educational and school psychologists are generally defined as psychologists working in settings directly related to primary and secondary education. Included in the *Study* are those psychologists who specifically identified themselves as educational or as school psychologists. A number of psychologists who quite appropriately identified themselves as clinical, counselling, or developmental psychologists, but whose work is in a school or school-related setting, are also included. In this statement the phrase "educational psychology" will be used to indicate this general area.

Large, Undertrained Group

Table 39, extracted from Table 16 of the *Study*, summarizes the fields of work and types of employing institutions of respondents in the area of educational psychology. Of a total of 1,238 psychologists reporting in this part of the survey, 225 or 18.2% identified themselves as educational or school psychologists, or were employed by school authorities, or both. Thus, educational psychologists comprise about one fifth of Canada's psychologists. No doubt some university employees work in direct connection with schooling, but identified their main interest as counselling, developmental psychology, or simply university teaching.

Table 39.—Fields of Work and Types of Employing Institutions of Educational Psychologists

Field of Work	Type of Employing Institution					
	Health and Welfare	Research Institute	Government	School	University	Total
Clinical Psychology.....				39		39
Counselling Psychology.....				42		42
Developmental Psychology..				1		1
Educational Psychology.....	4	1	3	23	19	50
School Psychology.....	8	1		52	2	63
Psychometrics.....				5		5
Industrial Personnel.....				1		1
Experimental.....				1		1
School Teaching.....				10		10
Administrative Executive....				9		9
Directors.....				1		1
Consultants.....				1		1
Other Occupations.....				2		2
Total reporting.....	12	2	3	187	21	225

Those employed by school authorities identify themselves with a wide variety of fields, but most often with school counselling or clinical psychology. Other employers include universities, such government departments as Health and Welfare, and research institutes.

Although about 42% of Canada's psychologists have doctoral degrees, only about 24% of educational psychologists hold doctorates. This difference indicates serious undertraining of our educational psychologists.

Research in Educational Psychology

About 16% of the research-involved psychologists who reported indicated that their research was in the area of educational psychology. However, some research that respondents classified primarily as clinical, social, psychometric, and developmental, would be related also to school settings, so that likely about 20% of research-involved psychologists are working in the general educational area.

Those conducting research in educational psychology are employed by several types of institutions, mainly schools and universities. About 15% of all psychologists are employed by schools, while about 12% of research-involved psychologists are employed by schools. However, only 2% of all principal research investigators (defined as persons in charge of independent research projects that are supported by *granting* agencies) are school employees. Thus, a large proportion of support for research in educational psychology is supplied intramurally by employing institutions rather than extramurally by granting agencies. Why should so few educational psychologists be grant recipients? Data from the *Study* indicate three obvious

reasons: (1) Most educational psychologists are undertrained, (2) grants for applied research of any kind are very scarce, and (3) educational institutions provide some support for "in house" research.

Research Funding

Table 40 classifies approximately the sources of support reported for research in educational and school psychology based on *total* value of project support current in 1966. The dollar amounts for educational and school psychology were obtained by adding those for these two categories as they appear in the *Study*. Educational psychology would appear to have obtained about 20% of the total research support received by all psychologists in Canada. However, about 87% of formal support for research in educational psychology comes from employing institutions, with only 13% coming from grants; this contrasts with about equal support from these two types of sources for psychological research as a whole in Canada.

Table 40.—Sources of Support for Research in Educational and School Psychology
(Based on total value of project support current in 1966)

	All Psychology		Educational and School Psychology		
	Value	Percentage	Value	Percentage of all Psychology	Percentage of Educational and School Psychology
Grant Support.....	\$3,185,000	47	\$ 161,000	5	13
Institutional Support.....	3,656,000	53	1,050,000	29	87
Total.....	\$6,841,000	100	\$1,211,000	18	100

Indeed the 29% of all institutional support going to research in educational and school psychology is the largest proportion of such support going to any area. Similarly, amongst types of employing institutions, elementary and secondary school systems provided much the largest proportion of institutionally derived research funds (\$1,000,000 or 27% of total institutionally derived funds), the modal category of research supported being classified as applied/basic.

In contrast, with regard to grant-supported research, no specialties within educational and school psychology were classified as receiving significant support (\$100,000 or more), and only school learning and special education received modest support (\$25,000 to \$100,000). Educational measurement, programmed learning, school psychology, and teacher personnel research received little support (less than \$25,000), and school adjustment and student personnel research received no support. Of specialties in areas closely related to educational and

school psychology, childhood and adolescence research received significant grant support, but educational counselling and nursery and preschool specialties received no support.

The *Study* notes that the areas of clinical, experimental, educational, and social psychology were nominated by significant numbers of respondents as "underdeveloped" and "especially promising" and on both counts deserving of increased support. No other major areas or specialties were recommended for increased support nearly so frequently as the above four.

These views of Canadian psychologists take on additional import when related to the reminder that dollar value of financial support cannot by itself be accepted as an index of adequacy or inadequacy of support in a given area or specialty. For example, effective research in educational psychology often requires laboratory schools, which are expensive to establish and maintain, or often includes extensive field research, which is relatively costly in terms of travel and subsistence for necessary sampling procedures and close on-the-spot supervision to be maintained. (See related comments in discussion of Social and Developmental Psychology.—Ed.)

It is worth noting that of total annual grant value from Canadian federal sources for psychological research projects continuing through 1966, the National Research Council and the Defence Research Board are by far the largest contributors, together accounting for 63% of grant value from Canadian federal sources. Support for research in educational and school psychology is seldom available from N.R.C. or D.R.B. In contrast, federal government sources that occasionally support research in educational and school psychology, such as Canada Council, contributed a very much smaller proportion of Canadian federal funds for psychological research.¹

The training of project directors presents a picture of considerable relevance for research in education and school psychology. (It will be remembered that the major proportion of research support for this area is institutional support.) For grant-supported research the highest degrees held by principal investigators are doctorates, masters, and baccalaureates in the proportions of 88%, 10%, and 2%, respectively; for project directors of institution-supported research the corresponding proportions are 48%, 14%, and 38%, respectively. Clearly, persons in charge of research projects in educational and school psychology are under-trained in relation to those in charge of grant-supported research. The *Study* draws attention to the need for further enquiry into the implications of the fact that so large a proportion of intramural research project directors are at the baccalaureate level, and such a relatively small proportion at the doctorate level.

Educational Psychology in Universities

Chapter 3 of the *Study*, concerned with psychology as a whole in relation to universities, applies in principle almost in entirety to educational psychology

¹ (Further, Canada Council Director Jean Boucher, in a joint meeting with the Board of Directors of the Canadian Psychological Association and the Conference of Chairmen of University Psychology Departments in June, 1967, made it clear that Canada Council support of psychological research is intended for projects in and related to social psychology and not for clinical, educational, or school psychology.—Ed.)

as well. This includes particularly such matters as the following: the likely doubling over the next five years and tripling over the next ten of undergraduates, graduate students, and academic staff; the need to maintain faculty-to-student ratios such that reasonably close contact with and supervision of student work can be maintained; the need to provide graduate student support that will keep good Canadian students and attract good immigrant students; the need to be competitive with the United States for staff; and the need to expand equipment and facilities of academic departments.

In this latter connection it is worth noting that equipment and facilities for child study (closely related to the area of educational psychology) were assessed by department chairmen as among the lowest in terms of current availability and among the highest in terms of need.

To this writer the *Study* has brought an urgency to the need for upgraded training and research in educational psychology. The obvious need for such upgrading must be faced by policy makers in: (a) universities; (b) granting agencies; (c) professional organizations and (d) agencies that hire educational psychologists. Such matters as the nature and content of core programs, practicums, research experience and dissertations, and their attractiveness to able students in such areas as educational psychology, have been debated by Canadian psychologists for some time. This statement will not expand on such debates. But has not this *Study* underlined the urgency of need for decision and action in upgrading training programs that will help educational psychologists to advance knowledge and provide improved service to clients.

Future Needs for Research Support in Educational Psychology

Again, the content of Chapter 4 of the *Study*, concerned with forecasting research support needs for psychology in general, applies in principle to educational psychology as well. The *Study* cautions that forecasting is a precarious art at best, and also that respondents' data concerning institution-supported research were less clear than information available on grant support. However, because of the current dependence of research in educational and school psychology upon institutional support, some further comment may be in order.

Table 38 of the *Study* builds from the current (1965-66) amount of *grants* of \$3.37 million. From this basic figure, two forecasts of annual research support needed for psychology as a whole are projected (\$14.61 million for 1970, and \$30.825 million for 1975). But support for psychological research in 1965-66 came both from *grants* and from employing *institutions*. While the annual value of institutional support in 1965-66 may not be readily available, the total current institutional support in 1966 appears to be roughly comparable with the total current grant support in 1966 of \$3.18 million (Table 17).

If this impression is correct, the basic figure for annual value of current support for psychological research from grant *and* institutional sources should be about doubled, and the calculations of overall psychological research financing costs accordingly modified.

Further questions concerning future needs for research support, of particular concern to the area of educational psychology, arise from the current 6 to 1 ratio of institutional support to grant support. If this ratio is to continue over the next ten years, and if the projections of needs from institutional sources parallel those made in the *Study* of needs from grant sources, what steps must be taken now by institutions to see that their annual budgets for research in educational psychology are about three times their current size by 1970, and perhaps ten times their current size by 1975? This question is particularly relevant for elementary and secondary school systems, which are currently the largest supporters of research in this area.

But perhaps granting agencies, employing institutions, and psychologists should ask whether this 6 to 1 ratio is appropriate in support of research in educational and school psychology. A reasonable proportion of research in this area will likely continue to be of the applied/basic or applied variety and hence be likely to have high priority for institutional support. But as project directors, principal investigators, and service practitioners become better prepared, and as the area itself develops greater liaison with other fields of psychology, including basic fields, to what extent should research in the area become much more of the basic/applied variety? Can problems arising from educational settings generate sufficient basic interest to warrant much more grant support? To what extent have granting agencies some responsibility for encouraging more basic/applied research in this area? On the other hand, to what extent are educational psychologists now alive to quite basic aspects of what might at first sight appear to be very applied research problems? To what extent are they now aware of and actively seeking possible grant support for their research? These questions could well provide the basis for further data collection by educational psychologists.

Summary

Educational psychologists, described as psychologists working in settings directly related to organized schooling, comprise about one fifth of Canada's psychologists. Those employed by school authorities identify themselves with a wide variety of fields, most often with school counselling, or clinical psychology. Their level of academic training is considerably below that of Canadian psychologists in general.

About one fifth of research-involved psychologists are conducting research in the general area of educational psychology, the modal category of their research being applied/basic. They receive about one fifth of the total financial support for psychological research in Canada, but while for all psychology the ratio of grant support to institutional support is about 1 to 1, for educational psychology it is about 1 to 6. Only about 5% of grant support for psychological research in Canada goes to this area. The level of academic training of research project directors in educational psychology is considerably below that for principal investigators generally.

While educational psychology shares with psychology as a whole the implications of the main *Study* concerning psychology in universities, a special urgency is attached to the immediate upgrading of training programs. Since training pro-

grams are much influenced by the funds available for particular kinds of research and training, some responsibility for action in this connection may rest with granting agencies as well as with universities and psychological associations.

When current annual values of *both* grant sources and institutional sources of financial support for research in psychology are used as basic figures for projections, this approximately doubles the forecasts of psychological research financing costs made in the *Study*.

Several questions were raised concerning implications of the current 1 to 6 ratio of grant to institutional support for research in educational psychology. While these questions were not discussed, it is suggested that both this area and psychology in general might profit by consideration of a greater proportion of emphasis on basic/applied research, and a greater proportion of grant-supported research, in educational psychology.

—R. S. MACARTHUR

SOCIAL AND DEVELOPMENTAL PSYCHOLOGY

Characteristics of Psychologists in These Areas

Small numbers.—Table 16 of the *Study* indicates that a mere 1.5% of Canadian psychologists categorize their occupation as “social psychology”. Even if we assume that some of those identifying themselves in terms of “university teaching” have major interests in this area, it is unlikely that the total number would reach the figure of 6% which is characteristic of the profession in the U.S.¹ On the other hand, the proportion identifying with “developmental psychology” is the same in the two professional populations.

In addition to the relatively smaller size of the Canadian, as compared to the U.S. psychological community there is a further under-representation of social psychology within the community. Thus, in terms of population size the supply of social psychologists in Canada appears to be grossly deficient.

Academic Base.—Among those identified with the two areas under consideration 78% are employed in universities (Table 16), but the real percentage is almost certainly higher, if one makes allowance for some persons in these areas who have identified themselves as university teachers. The comparable U.S. figure is 68%, which indicates a certain under-representation of this type of psychologist in Canadian “service” employment. It is likely that the general nature of psychologists’ service functions would be very favorably affected by adding considerably to the number of social and developmental psychologists in these settings. Not only would this open stimulating new perspectives, but it is also a way of introducing persons with a strong research orientation into service settings. Evidence presented in the *Study* suggests that the number of research grants in the social area is equal to the number of grants in the clinical area (Table 21), in spite of the disparity in the numbers of psychologists active in these areas.

Inadequate supply of highly trained persons.—The *Study* shows that the proportion of non-Canadian and non-Canadian-trained psychologists is higher

¹ American Psychologist, 1966, 21, 225.

among those with academic than those with non-academic functions. In view of the high concentration of developmental and social psychologists in academic settings it seems probable that the number of Canadian-trained persons in these areas must be quite small. This should be true particularly of social psychologists, because of their very small numbers in terms of the total community of psychologists.

Inadequacy of training in these areas is further indicated by the fact that the proportion of those with doctorates reaches only about 60%, whereas in the area of experimental psychology the corresponding figure is about 80% (Section 1.14). Yet, the proportion of those working at universities is almost the same for both these fields. This means that there are relatively more academic psychologists without doctoral qualifications in the developmental-social areas than in general experimental psychology, a state of affairs which cannot be advantageous for the training of future generations of graduate students in those areas. It would seem desirable to take special steps to improve this situation, for example, by providing appropriate incentives to attract highly qualified social and developmental psychologists from elsewhere. These would be required if the exceptionally large gap between social and academic needs and the output of adequately trained social psychologists by Canadian graduate schools is to be closed.

Research in the Areas of Developmental and Social Psychology

Low proportion of principal research investigators.—According to survey data obtained for the *Study*, 38 Canadian psychologists in the sample indicated “social psychology” as their first research specialty. This figure corresponds almost exactly with the number of current research grants in the area (37). However, another 50 psychologists apparently indicated that they were doing some research in this area. (Figure 6). In the case of developmental psychology only about one third of those indicating that they were engaged in research in the area appear to have held grants (Table 21). These figures seem to show that the proportion of principal investigators to research-involved psychologists is not so high in these areas as in general experimental psychology. Since the proportion of academic psychologists is almost the same in the two fields, it looks as if university teachers in the social and developmental areas include a higher proportion of persons who do not hold research grants in these areas though they are engaged in research.

Various factors could contribute to this, including the lower proportion of doctorates, the possibility of doing very inexpensive research, and a possible tendency for some individuals to treat such research as a secondary interest. Whatever the background, it is clear that this situation is likely to have a deleterious effect on graduate training in these areas. The professor who is a principal research investigator is of vital importance for the graduate program, because of the way in which he is able to support the student’s apprenticeship experience. There is a real need to increase the *number* of available research grants, quite apart from questions of their average size.

Level of research support—The overall value of research grants in developmental and social psychology currently appears to have a somewhat unfavorable relationship to the proportion of psychologists engaged in research in these

areas (see Table 21 and Figure 6). While the relatively greater level of support for other areas of academically based research may reflect higher equipment costs, the reports by psychology department chairmen seem to indicate that other factors should also be considered. Table 36 shows that while most Canadian psychology departments do have facilities for research in the "social psychology, personality" area, there is a striking preponderance of facilities labelled "inexpensive"—in fact this area is unique in the unfavorable balance between expensive and inexpensive facilities. That this is hardly due to the greater effectiveness of inexpensive facilities is suggested by the high level of need for more adequate facilities believed to exist. While 12 departments have other than inexpensive facilities in this area, 11 chairmen report the further need for facilities of this type, a ratio that is reached only for the area of psychopharmacology. The areas under consideration apparently have lagged behind other areas of psychological research in the provision of the more sophisticated types of equipment and facilities. Such facilities have however become mandatory for good research here as elsewhere. (See related comments in discussion of Educational and School Psychology.—Ed.)

In this connection it is of interest to note the extraordinarily low level of support which universities provide for developmental and social psychological research. (Table 19 refers to "employing institutions", but most research psychologists in this area are employed by universities.) Whereas employing institutions provide about 18% of research funds in the experimental psychology area, the corresponding figure for the social area is 7%. (The figure for the developmental area is difficult to interpret because of the possibility that respondents may not have made a sharp distinction between this category and the category of educational psychology.) Independent sources of research support will no doubt retain their primary importance, but an increase in institutional support for social psychological research appears to be called for. This would also help to attract more highly qualified persons to academic positions in this area and improve the unfavorable ratio of psychologists with doctorates which was discussed previously.

Research support for specialties.—Table 22 and Table A-3 indicate the uneven nature of research support within the areas under discussion. Clearly there are certain "fashionable" or favored research topics that tend to attract the bulk of available research funds, while other areas are neglected. For example, in the developmental area the lack of grant support for research on pre-school children is quite striking and appears to lack a rational basis. Similarly, the neglect of topics like leadership and public opinion in Canadian social psychological research is difficult to justify. Limited resources obviously cannot be spread evenly over all specialties, but it appears desirable to encourage some research at least in certain key areas that tend to have a relatively good pay-off in terms of their influence on student training and research in other areas. The present pattern of specialty support within the areas under consideration seems to suggest the existence of a split between predominantly basic and predominantly applied research, while topics which offer greater opportunities for integrating

basic and applied research are relatively neglected. It can be expected, however, that with the recent emergence of the Canada Council as a major source of research support in this area, the pattern will be likely to change.

Gap in research support agencies.—Current interest in improvement of education, which has been coupled with a progressive rapprochement between educational psychology and experimental child psychology, must inevitably lead to a steep rise in the demand for developmental research. Yet one conspicuous lacuna in the present research-support picture is the lack of an agency inviting proposals for psychological research, whether basic or applied, that has a bearing on educational problems. In the United States, vast sums have been poured into such research by the U.S. Office of Education and by private foundations like the Carnegie Corporation and the Ford Foundation. Since there is no federal Department of Education and there are no private foundations with comparable resources in Canada, equivalent sources of support do not exist.

With the establishment of the Ontario Institute for Studies in Education and of similar institutes in other provinces, there has been a sharp increase in funds for educational research, including research in areas of psychology that are of interest to education. These funds have been almost entirely reserved for research by staff members of these institutes, however. Programs whereby research grants are awarded to individuals working in universities and comparable institutions, for research that they themselves have conceived, have not so far been accepted as responsibilities of these new bodies. The policy of dividing research funds between intramural and extramural research has been adopted with signal success by other agencies, notably, the National Research Council, the Defence Research Board and, in the United States, the National Institutes of Health. There are strong arguments in favor of such a policy, such as the need to have research in a particular area spread among several centers and the need to make full use of the abilities of existing personnel at a time when the recruitment of competent staff for new institutions is especially difficult.

Summary

The major limitations of the areas analyzed may be summarized as follows:

- (1) Under-representation in the Canadian psychological community (especially true for social psychologists).
- (2) Inadequate utilization of specialists in these areas in service settings.
- (3) Inadequate supply, both in relative and in absolute terms, of trained specialists at the level of university teaching.
- (4) Low proportion of specialists who have research grants.
- (5) Scarcity of good research facilities in the universities.
- (6) Lack of an agency that specializes in extramural grants for the support of psychological research with a bearing on education.

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LA PSYCHOLOGIE AU CANADA FRANÇAIS

Avant de connaître les résultats de cette enquête, on aurait pu se demander s'il était bien nécessaire de faire des commentaires spéciaux sur la situation de la psychologie au Canada français. Un bref examen des chiffres publiés dans ce rapport démontre cependant que tout Canadien qui s'intéresse au développement de la psychologie, sous ses aspects scientifique et professionnel, a le devoir de considérer sérieusement les conclusions à tirer d'une telle analyse. Bien qu'une très faible proportion des données seulement ne se prête à des comparaisons directes des populations de langue française et anglaise, on trouve dans ce document plusieurs signes évidents du manque de ressources du psychologue de langue française. Pour se maintenir au rythme actuel de développement ou, mieux encore, pour espérer pouvoir rejoindre son collègue de langue anglaise, le psychologue canadien-français devra s'attendre à ce que l'on fasse des efforts considérables en vue de promouvoir la recherche psychologique dans les institutions de langue française. Ce problème, il faut l'admettre, est celui de tous les Canadiens, puisque le fait de négliger l'exploitation du potentiel scientifique et professionnel d'une très large partie de la population ne peut que nuire à l'ensemble du pays.

Plusieurs conclusions de cette enquête s'appliquent indifféremment à tous les psychologues canadiens; ceci démontre encore une fois que, dans un groupe qui partage les mêmes intérêts scientifiques ou professionnels, on rencontre plus de ressemblances que de dissemblances. C'est pourquoi l'avenir de la psychologie au Canada français semble étroitement lié à celui de la psychologie canadienne en général. Il est nécessaire cependant de prendre pleine conscience des différences qui existent, car celles-ci peuvent avoir une influence appréciable sur l'évolution de la psychologie canadienne. C'est ce que nous tenterons de faire dans cette brève analyse de la situation présente.

Le psychologue au travail

Avant d'aborder l'étude des caractéristiques des psychologues canadiens-français, il convient de signaler qu'un très petit nombre de ceux-ci seulement ont répondu au questionnaire qui leur était adressé. On pourrait, si on le devait, trouver plusieurs raisons qui expliquent cette attitude vraisemblablement négative. Notons simplement que, puisque les conclusions dans ce cas reposent nécessairement sur des extrapolations, les interprétations doivent être marquées de la plus grande prudence. Il est bien possible aussi que les réponses de plusieurs psychologues de langue française n'aient pas été classées comme telles. A la page 24, on dit que ce groupe de psychologues «a été identifié d'après le fait qu'ils ont demandé ou qu'ils ont retourné la version française du questionnaire». Comme, dans bien des cas, à notre connaissance, la version anglaise du questionnaire est parvenue au psychologue avant la carte lui demandant de choisir l'une ou l'autre version, il est vraisemblable que plusieurs psychologues de langue française aient utilisé la version anglaise. D'autres peuvent avoir choisi de le faire sans se donner la peine d'écrire pour demander la version française; c'est d'autant plus probable que bon

nombre de psychologues de langue française ont une assez bonne connaissance de l'autre langue pour pouvoir lire et répondre à un tel questionnaire sans trop de difficulté.

Il est bien évident, si l'on tient compte de renseignements obtenus d'autres sources, que l'estimé qu'on a fait d'un nombre total de 210 psychologues canadiens-français (soit des psychologues nés au Canada qui utilisent le français dans une bonne partie de leur travail) est beaucoup trop faible. Les membres de la Corporation des psychologues de la Province de Québec sont au nombre de 410. Parmi ceux-ci, 316 se reconnaissent comme Canadien français. Il faut ajouter à ce nombre plusieurs psychologues qui travaillent dans les institutions fédérales du Québec et qui ne sont pas tenus, par la loi, de faire partie de la Corporation. C'est le cas également d'un groupe imposant de psychologues qui sont dans les maisons d'enseignement (universités, collèges et écoles normales). De plus, plusieurs psychologues canadiens-français se trouvent dans d'autres parties du Canada, principalement en Ontario et au Nouveau-Brunswick. Il serait par conséquent plus exact d'évaluer la population canadienne des psychologues de langue française à un minimum de 400 et alors ils représenteraient plutôt 23 que 13% de la population canadienne. Ce chiffre correspond précisément à la proportion des psychologues canadiens qui résident dans le Québec. C'est donc que le nombre de psychologues de langue anglaise au Québec n'est probablement pas beaucoup plus important que celui des Canadiens français qui vivent en dehors de la Province.

Cette correction, toutefois, n'aurait apparemment que très peu de conséquences sur les autres chiffres de cette première partie du rapport qui traite des caractéristiques professionnelles des psychologues du Canada. Le nombre de psychologues par rapport à l'ensemble de la population québécoise est en fait très petit si on le compare à celui des autres provinces, plus particulièrement de l'Ontario et des provinces de l'Ouest. De même, puisque au Canada, 31.5% des psychologues qui détiennent un doctorat ne sont pas des citoyens canadiens, il s'ensuit que la proportion des psychologues de langue française qui détiennent un doctorat doit être aussi faible, sinon peut-être plus faible, que celle des psychologues canadiens de langue anglaise. On doit faire remarquer que cette difficulté qu'éprouvent les psychologues canadiens d'atteindre au doctorat trouve une explication partielle dans le fait que les universités canadiennes en général ne se sont jusqu'ici que très peu préoccupées de donner, au niveau du doctorat, une formation en psychologie appliquée. Aux États-Unis, par ailleurs, les départements de psychologie qui décernent le plus grand nombre de doctorats sont en général ceux qui font la plus large part dans leur programme à l'application de nos connaissances psychologiques. On en a une preuve à la page 16 du présent document où l'on note que, en 1964, 60% des psychologues américains qui travaillaient en psychologie clinique ou en orientation (counselling) détenaient des doctorats par comparaison avec seulement 27% des psychologues canadiens que l'on trouve dans les mêmes domaines en 1966.

Le rapport démontre que les psychologues de langue française forment une grande proportion (17.1%) de ceux qui se consacrent à l'orientation alors qu'ils sont très peu représentés dans les domaines de la recherche (4.1%) et de

l'administration (4.8%). Des 90 psychologues identifiés comme étant Canadiens français lors de l'analyse du questionnaire, pas moins de 63 (soit 70%) se retrouvent dans l'une ou l'autre des quatre fonctions suivantes: administration des tests, enseignement, orientation et psychologie clinique. Ces faits découlent de la situation particulière qui prévaut au Canada français. Là où la population est en majorité d'expression française, les services psychologiques doivent être assurés par un personnel de langue française. Il n'est pas possible dans ces domaines, comme ce semble être le cas dans le reste du Canada, de compter sur la suppléance de psychologues américains. De même, il y a très peu à attendre d'éventuels renforts en provenance des pays européens de langue française; le nombre des psychologues français, belges ou suisses est très restreint, et, dans bien des domaines, semble à peine suffisant pour répondre aux besoins de ces pays eux-mêmes. Le seul espoir d'en arriver à une amélioration réside dans l'intensification des efforts actuels de nos institutions canadiennes de langue française et dans l'adoption de mesures en vue d'encourager nos étudiants à poursuivre leur formation jusqu'au niveau du doctorat.

La recherche psychologique

Ce document fournit peu de renseignements précis sur la participation des psychologues de langue française à la recherche. Les seules données à ce sujet découlent du tableau 15 où l'on voit que seulement 4.1% de ceux qui considèrent la recherche comme constituant leur fonction principale sont des Canadiens français. Ici, encore, il faut se montrer prudent dans l'interprétation. On n'a pas d'indications sur le nombre total de psychologues qui s'occupent de recherche, que ce soit comme fonction principale ou additionnelle. En se basant sur le nombre de travaux publiés par des psychologues canadiens-français, on peut affirmer que plusieurs se livrent à des activités de recherche pour lesquelles ils ne reçoivent apparemment pas d'aide financière et qu'ils doivent donc considérer comme des fonctions additionnelles. Il n'en reste pas moins qu'un trop petit nombre de psychologues de langue française peuvent s'adonner à la recherche. Étant donné que 60% des psychologues canadiens-français travaillent dans les domaines de psychologie appliquée (voir le tableau 15) et que, au Canada, on consacre très peu d'argent à la recherche dans les domaines de la psychologie clinique, de l'orientation, de la personnalité et de la psychométrie, une grande partie de la population ne reçoit pratiquement aucun encouragement à la recherche.

Il faut noter aussi que, au Canada, la plus grande partie de la recherche psychologique se fait à l'université (voir figure 5). Pour diverses raisons, le psychologue canadien-français n'a pas fait application auprès des agences du gouvernement américain et par conséquent il n'a reçu pratiquement aucune assistance (s'il en est) de ce côté. Or, l'enquête que l'on vient de faire démontre que la plus grande partie des argents de recherche dévolus au Québec proviennent d'organismes américains (voir figure 8). On peut donc conclure que cet appui financier s'adresse en grande partie, sinon en totalité, aux psychologues qui travaillent dans les universités de langue anglaise de la province. Le rapport indique également que, de toutes les provinces canadiennes, Québec est celle qui

reçoit proportionnellement le moins d'assistance des sources fédérales, de même d'ailleurs que de toutes les sources canadiennes. Ces faits ne sont pas le signe d'une discrimination concertée de la part des organismes fédéraux. Ils permettent de constater, cependant, qu'un très petit nombre de psychologues canadiens-français font application auprès de ces organismes et que, comme il n'est pas du ressort des agences gouvernementales d'inviter directement les chercheurs à faire des demandes, la situation est restée ce qu'elle est depuis plusieurs années.

Comme on le dit dans le rapport, il faut se garder de présumer que les fonds de recherche, comme les bénéfices politiques, «doivent» être distribués au prorata de la population—de langue anglaise et française dans le cas présent. Le décalage est tellement grand, cependant, qu'il importe de prendre le problème en considération. Il faudrait savoir pourquoi les psychologues de langue française sont si peu portés à demander des octrois de recherche. On trouvera peut-être que la société canadienne en général aurait beaucoup à gagner si l'on prenait des mesures immédiates en vue d'encourager le développement de la recherche psychologique dans les institutions de langue française. On pourrait le faire de diverses façons. Par exemple, les représentants des agences gouvernementales qui s'intéressent à la recherche psychologique pourraient rencontrer les psychologues susceptibles de s'adonner à la recherche dans les diverses institutions et discuter avec eux des moyens à prendre pour intensifier l'activité de recherche dans chaque cas. Il ne fait aucun doute que, pour remédier à la situation dans son ensemble, il faudra former un plus grand nombre de psychologues canadiens-français de grande compétence et, pour ce faire, il y aurait probablement lieu de recruter dans nos universités des professeurs de recherche. De même, nos meilleurs étudiants gradués devraient être encouragés à compléter leur formation dans les autres universités canadiennes et américaines. Pour faciliter la recherche, il faudrait également améliorer l'outillage des laboratoires existants et y attirer les meilleurs étudiants en mettant des bourses à leur disposition. Somme toute, ce n'est qu'en tentant un effort spécial qu'on pourra corriger une situation qui risque de nuire considérablement au progrès de la psychologie scientifique au Canada.

La psychologie à l'Université

Le tableau 28 donne le nombre d'étudiants gradués inscrits dans chaque université canadienne. Si l'on compare ces données avec celles du tableau 31 sur le corps professoral, il y a lieu de se demander si toutes les institutions de langue française ont interprété l'expression «graduate students» dans le même sens: la proportion du nombre d'étudiants par professeur semble varier considérablement. Il est donc possible que le chiffre total de 168 étudiants gradués inscrits dans les universités de langue française du Québec en 1966 soit trop élevé. Cependant, ce n'est là que 16.1% de la population totale de ces mêmes étudiants dans tout le pays. La seule autre université où l'on pourrait rencontrer un nombre appréciable d'étudiants canadiens-français est l'Université d'Ottawa, qui offre un programme bilingue. Enfin, il est probable que l'on trouve relativement beaucoup moins d'étudiants canadiens-français dans les autres universités canadiennes et à l'étranger que l'on ne compte de Canadiens d'expression anglaise

qui étudient la psychologie en dehors du Canada. Par conséquent, la population des étudiants gradués de langue française semble très petite par comparaison avec celle du reste du pays. Ce fait est plutôt inquiétant si l'on considère que ce contingent représente à l'heure actuelle à peu près la seule source de recrutement des universités de langue française et également les effectifs qui devront pourvoir aux besoins sans cesse grandissants de la population canadienne-française.

Conclusion

Ce document démontre, sans l'ombre d'un doute, que comparativement la psychologie au Canada français tire de l'arrière. Ce retard s'explique en partie par le fait que la psychologie canadienne en général a pu compter largement sur l'immigration des psychologues américains et sur les fonds de recherche du gouvernement américain. Au cours des dernières années, le gouvernement canadien a augmenté considérablement sa contribution à la recherche psychologique. Le psychologue canadien-français n'a pas encore participé pleinement à cet essor. Il est à espérer que ce rapport servira à attirer l'attention sur la nécessité d'un effort concerté en vue d'accélérer le développement de l'enseignement gradué et de la recherche dans les institutions canadiennes de langue française de façon à ce que tous les Canadiens puissent participer au progrès scientifique et à l'amélioration des conditions de vie de toute la population. Le rôle que jouera le Canada dans l'évolution de nos connaissances psychologiques et leur application au bien-être de l'homme en général dépendra des mesures qui seront prises pour corriger la situation actuelle et stimuler la recherche dans les institutions canadiennes-françaises comme dans toutes les institutions canadiennes.

— David BÉLANGER

PSYCHOLOGY IN FRENCH CANADA

Until results of this *Study* became available, it was not evident that special comments on the state of psychology in French Canada were necessary. Careful study of the data presented shows, however, that there are indeed good reasons for any Canadian interested in the development of psychology as a science and a profession, to pay serious attention to the revealing conclusions that may be drawn from this analysis. Although a very small proportion of the data will allow direct comparisons between the English- and French-speaking population, conclusions from this report tend to show that French Canada's psychologists are lagging behind. If they are to keep up, or rather catch up, with the present Canadian trend, facilities for psychological research in French-language institutions will have to be considerably expanded. It is taken for granted, of course, that this should be of concern to all Canadians, since the failure to use the resources of any large segment of the community would be detrimental to the country as a whole.

Several conclusions of the *Study* apply indiscriminately to all of Canada's psychologists. This is an indication that among any groups of common profes-

sional or scientific interest there are more similarities than dissimilarities. Therefore, the future of psychology in French Canada seems to be closely bound to that of Canadian psychology generally. Yet, it is necessary to take full account of the existing differences, for these may affect the evolution of Canadian psychology to a considerable degree.

Employment Characteristics

Before commenting on the French-Canadian population of psychologists, some consideration should be given to the fact that the response rate from this group is very low. Several hypotheses could be offered in explanation for this apparently negative attitude toward the questionnaire, but the fact remains that, due to the necessity for extensive extrapolation of the data, we must be extremely careful in our interpretations. It is quite possible also that several French-Canadian psychologists have not been identified as such. Section 1.13 mentions that this group of psychologists "were identified by their request for or return of the French-language version of the Questionnaire". Since, in many cases to our knowledge, the English-language version of the Questionnaire reached the respondent before the card asking him to select the French or English form, it is possible that several French-speaking psychologists answered on the English form. Others may have chosen to do so, without going to the trouble of asking for the French form, since a great proportion of French-speaking psychologists are familiar enough with the English language to read and respond to such a Questionnaire with little difficulty.

It is quite apparent, when we make comparisons with evidence from other sources, that the estimate of 215 French-Canadian psychologists (that is Canadian-born psychologists who carry on most of their work activities in the French language) is much too low. There are 410 psychologists registered with the Corporation of Psychologists of the Province of Quebec. Of this number, 316 identify themselves as French Canadians. We must add to this number several psychologists working in the Federal institutions of the Province of Quebec who are not, by law, required to register with the Corporation. The same would apply to an important number of psychologists in the teaching profession (universities, colleges, and teacher's colleges). Furthermore, there are considerable numbers of French-Canadian psychologists living in other parts of Canada, mainly Ontario and New Brunswick. It would therefore seem more accurate to estimate the population of French-speaking psychologists in Canada to be 400, at least. Thus they would make up 25% rather than 13% of the Canadian psychologist population. This would correspond exactly to the proportion of the Canadian population of psychologists residing in Quebec. This means that the number of English-speaking psychologists working in Quebec is probably not much larger than that of French-speaking psychologists living in other parts of Canada.

This correction, however, would have no apparent effect on the other data presented in the first part of the *Study* on the employment characteristics of Canada's psychologists. The ratio of psychologists to population is indeed very low in Quebec compared with other provinces, more specifically Ontario and the

western provinces. In the same way, since 31.5% of the psychologists holding a doctoral degree in Canada are not Canadian citizens, it follows that the proportion of French-speaking psychologists at the doctoral level must be as low, if not lower than that of English-speaking Canadian psychologists. It must be noted here that this much lower attainment on the part of the community of Canadian psychologists could be explained partly by the fact that Canadian universities have made little effort in the past toward the training of service-oriented psychologists at the doctoral level. In the U.S., on the other hand, the university psychology departments where the largest number of doctoral degrees are granted are in general those that pay greater attention in their curriculum to the application of psychological knowledge. Confirmation of this may be found in section 1.8 of the present *Study*, where it is indicated that, in 1964, 60% of U.S. psychologists in clinical and counselling functions held doctoral degrees compared with only 27% of Canadian psychologists working in the same areas in 1966.

As noted in the *Study*, the French-speaking population of psychologists contribute disproportionately (17.1%) to the counselling function and are under-represented in research (4.1%) and administration (4.8%). Out of 90 identified French-Canadian respondents indicating their principal function, as many as 63 or 70% are absorbed by the following four functions: testing, teaching, counselling and clinical. These facts reflect the particular situation prevailing in French Canada. Where the population is predominantly French, psychological services must be provided by French-speaking personnel. It is not possible in these areas—as seems to be the case in the rest of Canada—to depend on the assistance of U.S. psychologists. In the same way, we can expect little relief from European French-speaking countries; the population of psychologists in France, Belgium and Switzerland is very small and, in several areas of psychological science, is barely sufficient to meet the needs of these countries themselves. The only hope for improvement is to develop the present facilities for psychological training in our Canadian French-speaking institutions and to adopt measures whereby the student population will be encouraged to pursue this training at the doctoral level.

Psychological Research

This *Study* provides little direct information on the contribution of French-speaking psychologists to psychological research. The only evidence comes from Table 15 which shows that only 4.1% of those respondents reporting research as their principal function are French-Canadian. Again, this figure must be interpreted with some caution. It gives no indication of the total number of French-speaking psychologists engaged in research, although research may not be their principal function. Judging from publications by French-speaking psychologists, it is evident that some research is being done without apparent financial support and therefore must be carried out as an additional function. Nevertheless, it is undeniable that too small a number of French-speaking psychologists can, and do, engage in research activity. Since 60% of the French-Canadian psychologists are in the service areas (Table 15), and since little support is avail-

able in Canada for research in the clinical, counselling, personality, and psychometrics areas, much of the population receives practically no encouragement towards the pursuit of research.

Moreover most of the research activity in Canada is carried out in the universities (Figure 5). For several reasons, the French-speaking psychologist has not been applying to U.S. government agencies and, therefore, practically no research support (if any) has been coming from these sources. Yet, the present *Study* indicates that most of the research money spent in Quebec comes from U.S. sources (Figure 8). This means that this support goes largely, if not completely, to psychologists working in Quebec's English-language universities. The *Study* also shows that, of all the Canadian provinces, Quebec receives proportionately the least help from Canadian federal sources, as well as from all Canadian sources. This does not mean that there has been deliberate discrimination on the part of the Canadian federal agencies; it indicates, however, that very few French-speaking psychologists have been applying for financial assistance. Since it is not the policy of the granting agencies to solicit applications directly, the situation has been dormant for several years.

As noted in the *Study*, the assumption should not be made that research funds, like political benefits, "ought" to be distributed in accordance with proportions of French- and English-speaking psychologists. The disproportion is so great, however, that some attention should be paid to this situation. It would be important to know why there is a dearth of applications from French-speaking psychologists.

It may prove to the benefit of the Canadian community as a whole that immediate steps be taken to encourage the development of psychological research in French-speaking institutions. This could be done in several ways. For instance, representatives from the fund-granting government agencies could consult those individuals who are likely to engage in research in the various institutions and discuss with them the means that could be taken to intensify their activity. There is no doubt also that French-Canadian institutions need a larger number of highly qualified psychologists and that they should recruit research professors. In the same way, our best graduate students must be encouraged to complete their training in other Canadian and American universities. Facilities for psychological research in the universities could be improved by providing for major installations, and for scholarships in those institutions where the capacities for the development of research now exist. This special effort seems to be the only way of correcting a situation detrimental to the Canadian population as a whole.

Psychology in Canadian Universities

Table 28 gives the number of graduate students enrolled in each Canadian university. A comparison of these data with those of Table 3 on faculty members raises some doubts about the interpretation given by respondents from French-language institutions to the expression "graduate students": the ratio of graduate students per staff member seems to vary considerably. It is therefore possible that the total number of 168 graduate students enrolled in the French-

language universities of Quebec in 1966 may be too high. Yet, it represents but 16.1% of the total population of graduate students in Canadian universities. The only other university where we may find a significant number of French-speaking graduate students would be the University of Ottawa, which offers a bilingual curriculum. Finally, the number of French-Canadian students enrolled in other Canadian and foreign universities is most probably much lower than that of English-speaking Canadians studying psychology outside Canada. It follows that the population of French-speaking graduate students is small compared with the total number of graduate students in Canada. This is rather alarming for French-speaking institutions, considering the fact that this is practically the only present source for the recruitment of those psychologists who will ensure the development of training and research in their own institutions and meet growing service needs in French-speaking areas.

Conclusion

In conclusion, the development of psychology in French Canada is lagging behind. This could be explained partly by the fact that Canadian psychology in general has relied heavily on the immigration of U.S. psychologists and on U.S. government research funds. During the last few years, help from Canadian sources has increased considerably. The French-Canadian psychologist has not yet taken advantage of this situation. It is hoped that this *Study* will draw attention to the dire need for accelerating the development of graduate training and research in French-language Canadian institutions in order that all Canadians may contribute to scientific progress and to the improvement of the living conditions of all the population. Canada's contribution to the evolution of our psychological knowledge and its application to the welfare of man in general will depend on the action taken to correct the present situation and stimulate research production in French-speaking as well as in all Canadian institutions.

— David BÉLANGER