Research Funding for Psychology

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ABSTRACT: *This report describes recent trends in funding for basic and applied research in psychology. Comparisons are made with other disciplines and in relation to available manpower. Some data are presented that bear on research costs, proposals funded, research quality, and support for young versus senior psychologists.*

On campuses and in research institutes across the country, the term *funding crunch* is used to describe the increasing difficulty scientists have in obtaining financial support for their research. Psychologists know about it from personal experience, from informal discussions with colleagues, and from occasional articles in the *APA Monitor* (e.g., Moore, 1976). Nonetheless, they probably have little systematic information about support for their own discipline. The following data are therefore meant to better inform psychologists about research funding.[1]

Federal Agencies That Support Research in Psychology

By far the most support for research in the behavioral and social sciences comes from the federal government. Table 1 shows which agencies claim support for different areas of psychology. According to these figures, the agency that ranks first in support for research in psychology is the Alcohol, Drug Abuse and Mental Health Administration; the Department of Defense (DOD) is next, followed by the National Institutes of Health (NIH), and the National Science Foundation (NSF).

Table 1 also provides some data on the 1974 status of psychology in overall research support. Of federal support for all research, 2% is for psychological research, and 6% is for all of the behavioral and social sciences. The year 1974 was not atypical; in fact, support for psychology decreased slightly in 1975 and 1976 as described below.

One should be aware that while the definition of basic research used by NSF in gathering these data is constant, some basic research in psychology may be underreported or, perhaps, overreported. Underreporting can occur when an agency supports applications of research or applied research but permits some basic research within the same contract or grant (as occurred in my own research for the National Institute of Child Health and Human Development). The fuzzy line between applied and basic research in many areas of behavioral science—and the fact that applications affect understanding as well as the reverse—render this mix appropriate although difficult to apportion. Overreporting of basic research is probably infrequent, although the Committee on the Social Sciences in the National Science Foundation (Note 1) found several instances of activity identified as *research* that might more appropriately have been called *action research, policy research,* or *development.*

Trends in Research Funding for Psychology

Figures 1 and 2 illustrate how federal support for basic and applied research has changed in the last 10 years. Table 2 shows, for basic research, de-

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[1] Most of this information was gathered during my tenure as staff director of a National Academy of Sciences committee whose purpose was to make recommendations for the social and behavioral sciences in the National Science Foundation. The chairman of the committee was Herbert A. Simon. The committee's final report has been published as *Social and Behavioral Science Programs in the National Science Foundation* (Committee on the Social Sciences in the National Science Foundation, Note 1). Neither the National Academy of Sciences, the National Research Council, nor the Committee is responsible for any part of the present article.

TABLE 1: *FY 1974 Federal Support (Obligation in $Thousands) for Psychology Research by Research Area and Federal Agency*

Federal agency	Basic research in colleges and universities				Total basic research				Total applied research			
	Biological aspects	Social aspects	Not elsewhere classified	Total	Biological aspects	Social aspects	Not elsewhere classified	Total	Biological aspects	Social aspects	Not elsewhere classified	Total
Action Drug Abuse	—	—	—	—	—	—	—	—	—	426	—	426
Department of Agriculture	—	—	—	—	—	8	—	8	—	18	—	18
Civil Service Commission	—	—	—	—	—	196	—	196	—	1,056	—	1,056
Department of Commerce	—	—	—	—	—	77	—	77	—	74	—	74
Department of Defense	1,040	5,607	436	7,083	2,951	8,439	1,773	13,163	3,468	30,104	100	33,672
Department of Health, Education and Welfare												
Alcohol, Drug Abuse and Mental Health Administration	6,814	3,901	—	10,715	12,733	7,104	—	19,837	21,679	12,706	—	34,385
National Institutes of Health	4,443	2,052	—	6,495	5,929	2,461	—	8,390	3,807	1,388	—	5,195
Center for Disease Control	—	—	—	—	—	—	—	—	153	869	—	1,022
Office of Human Development	—	—	—	—	—	—	—	—	—	5,218	—	5,218
Department of the Interior	—	—	—	—	—	—	—	—	—	244	—	244
National Aeronautics and Space Administration	37	—	429	466	265	1,200	429	1,894	1,337	4,539	48	5,924
National Science Foundation	3,430	1,850	—	5,280	3,628	1,967	—	5,595	720	220	—	940
Department of Transportation	—	—	—	—	—	—	—	—	—	71	—	71
Veterans Administration	—	—	—	—	189	49	—	238	3,990	1,009	44	5,043
Total for psychology	15,764	13,410	865	30,039	25,695	21,501	2,202	49,398	35,154	57,942	192	93,288
Total for behavioral and social sciences				71,858				122,557				311,628
Total for all sciences and engineering				948,712				2,465,247				4,707,700

Note. Funding estimates and classifications in this table were derived from figures published by the National Science Foundation (1975b; see Appendixes C and D. Tables C-4, C-14, C-26, C-33, C-36, C-52, C-55, and C-82). Data are provided in January of each year by 34 agencies and their subunits. Estimates are reconciled with budget documents and are also subject to further appropriations, apportionments, or allocation decisions.

The category of behavioral and social science includes the disciplines of psychology, anthropology, economics, history, linguistics, political science, sociology, law, and socioeconomic geography. Agencies classify research as either basic or applied according to its major purpose: a gain in more fundamental knowledge, or practical use. Development is the use of research information applied toward the production of materials, programs, or methods. Experimental programs and evaluations are apparently included in the research and development (R&D) figures, but some agencies (e.g., Social Security Administration) classify them as research, whereas other agencies (e.g., National Institute of Education) classify them as development. Excluded from R&D are demonstration projects, collection of statistics (except for research purposes), scientific and educational information dissemination, educational information (e.g., preparation of classroom guides), funds primarily for the training of scientific manpower, and R&D facilities or permanent equipment.

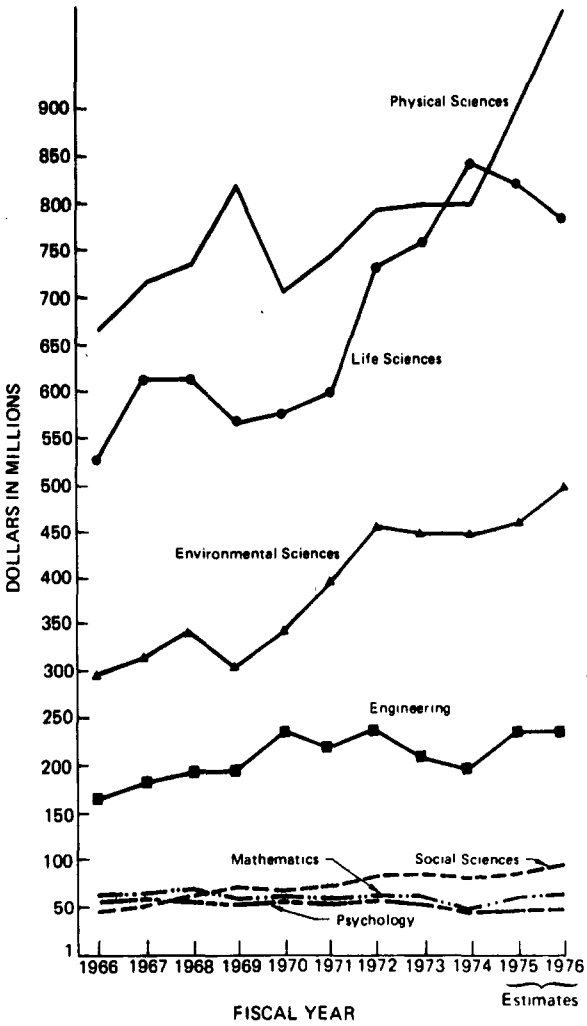


Figure 1. Federal obligations for basic research (data from National Science Foundation, 1967, 1975b).

tailed relative changes among the sciences and provides a separate analysis of changing support in NSF, whose primary mission is to foster and support basic research. These data show that the "funding crunch" has not hit all disciplines with equal force.

Since about 1970, federal agencies have emphasized making research more "usable," "transferable," and accountable (cf. Caty, Drilhon, Ferné, Kaplan, & Wald, 1974). This has meant a trend toward contracts and away from grants and institutional support, a trend toward more oriented and directed research and away from unsolicited research, and a trend toward new awards and away from continuation awards. The Office of Management and Budget has closely examined questionnaires that are used in contract research and has

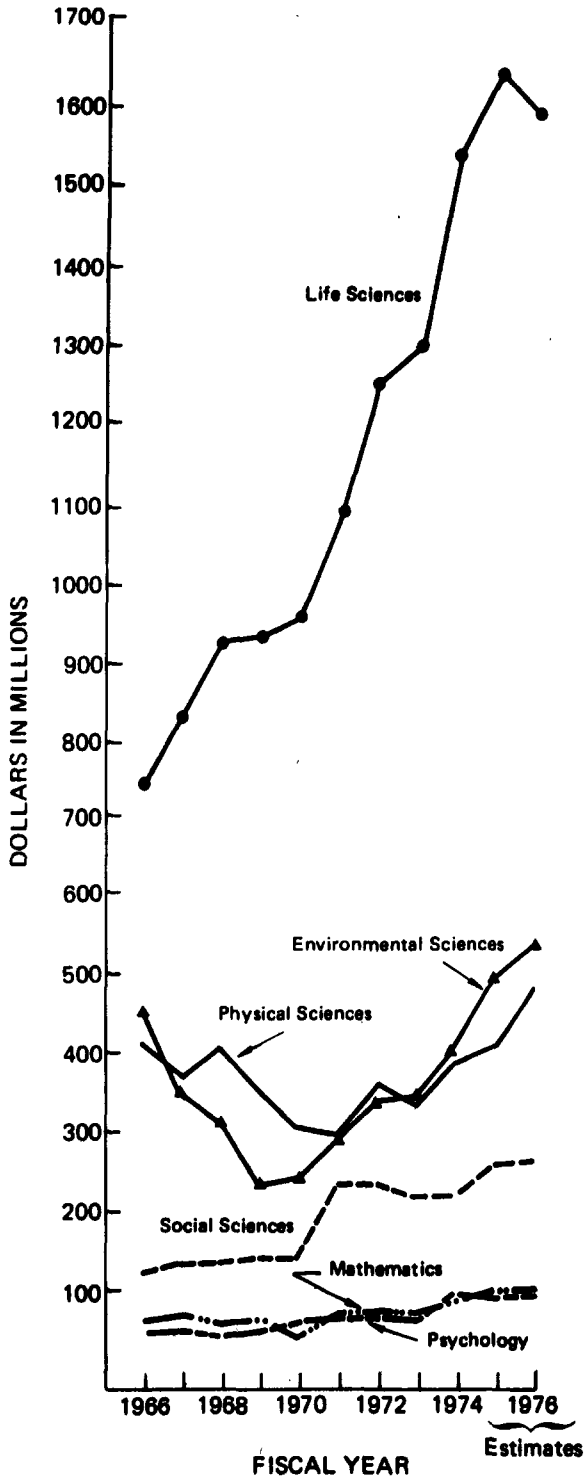


Figure 2. Federal obligations for applied research (data from National Science Foundation, 1967, 1975b).

thus blocked or seriously delayed some projects. A number of technology-transfer programs, needs-assessment programs, planning and policy efforts, and

TABLE 2: *Changes in Total Federal and National Science Foundation Funding ($Millions) for Basic Research, 1966–1976*

Field of science	Total federal			Total National Science Foundation		
	Actual 1966	Estimate 1976	Change (%)	Actual 1966	Estimate 1976	Change (%)
Physical sciences	667	1,000	+50	57.0	157.5	+176
Environmental sciences	291	499	+71	54.0	141.8	+163
Life sciences	552	753	+36	53.0	98.7	+86
Engineering	168	218	+30	20.5	61.9	+202
Mathematics	60	59	−2	14.5	30.3	+109
Social sciences	44	91	+107	11.6	27.6	+138
Economics	16.2	28.3	+75	2.7	7.2	+167
Sociology	9.1	16.3	+79	1.8	2.1	+17
Anthropology	9.3	7.3	−22	4.4	4.1	−7
Other[a]	9.6	26.5	+176	2.6	10.3	+296
Political science[b]	3.3	2.6	−21	1.3	1.3	0
Linguistics[b]	2.3	1.9	−17	1.3	1.5	+15
History[b]	4.1	7.6	+85	.5	1.0	+100
Psychology	53	48	−9	7.7	6.8	−12
Biological aspects	31.8	23.8	−25	5.4	4.5	−17
Social aspects	21.5	20.9	−3	2.3	2.3	0
Not elsewhere classified		3.0				

Note. Data derived from figures published by the National Science Foundation (1967, 1975b).
[a] In 1966 only, includes political science, linguistics, and history.
[b] "Actual" figures are for 1969.

utilization or dissemination programs have been strengthened or started (especially in NSF). In the Congress, the Mansfield Amendment (requiring research funded by DOD to apply to a military function) has led to cuts in basic research by NIH as well as by DOD. Congress has also mandated several specific research and development (R&D) programs, such as the Educational Satellite program. The extent to which funds that might have supported research have been transferred to these activities is of course unknown. However, the overall trend—at least for the behavioral sciences—is fairly clear: decreases or a holding pattern for basic research (especially unsolicited basic research) and increases for research planning, utilization, and dissemination.

At one agency, the National Institute of Education (NIE), funds allocated for the unsolicited basic-research grants competition went from $10-million in 1973, to $5 million in 1974, to less than $.3 million in 1975. (Agency sources estimate that actual obligations for all basic research were $7.6 million in 1974 and $2.3 million in 1975.) Meanwhile, dissemination programs (not including policy research) were obligated at $12.6 million in 1973, dropped slightly in 1974, and rose to $23.8 million in 1975. (Data are from NIE budget justification books.) The NIE experience in this respect was not unique for mission agencies. NSF could not entirely take up the basic research slack, although it did take over some support of cognitive psychology and linguistics.

Available Manpower and Scientific Support

Data on research dollars alone do not provide sufficient information about research funding. One must also consider the number of scientists available to do research, whether they actually apply for funding, the costs of research, the quality of proposals and publications, and many other factors difficult to measure (e.g., the effect of differential support on types of research attempted). Some data are available on some of these questions, although they are far from perfect and should be interpreted with caution.

Table 3 gives an estimate from the available data for federal funding dollars per university scientist engaged in basic research. Table 4 provides equivalent estimates for applied research. These data show that research psychologists in universities do not receive federal support in proportion to their numbers. Not tabulated are the distributions of university scientists and research dollars. These would show, for example, that while nearly 8% of university basic researchers are psychologists, just 3% of federal funds to universities for

TABLE 3: *Estimate of Federal Basic-Research Dollars Per University Scientist Engaged in Basic Research by Field of Science*

Field of science	Estimated no. of university scientists engaged in basic research in FY 1974[a]	Federal obligations for basic research at universities in FY 1974	Funds per basic-research scientist	Percentage of basic-research scientists receiving federal support[b]
All fields of science	67,800	$948,712,000	$13,992	51
Psychology	5,300	30,039,000	5,668	43
Economics	2,000	16,340,000	8,170	20
Sociology/anthropology	3,400	12,154,000	3,575	26
Biology	18,900	328,226,000	17,366	65
Medicine	2,900	82,042,000	28,290	72

Note. Data in Columns 1, 2, and 4 are from the National Science Foundation (1975d for Columns 1 and 4; 1975b, Appendixes C and D, for Column 2).
[a] Based on self-reported basic research as a primary or secondary activity (teaching often reported as primary activity when one choice given) in July 1973.
[b] Self-report.

basic research are distributed to psychology. In NSF, just 1.3% of the basic-research funds have been allocated to psychology in recent years. (In psychology, 95% of NSF basic-research funds went to university scientists—see National Science Foundation, 1975b, Tables C-33 and C-82.)

These data can easily be criticized. For example, the frequency data do not account for possible systematic differences in time spent on research, and the funding data show neither how many persons applied for funds, how much support they needed, nor how many proposals were of a quality deserving support.

WORK EFFORT

Unfortunately, there exist no FTE (full-time-equivalent) data to support or reject the first criticism. Nevertheless, one can use another estimate of university scientists in comparing research dollars with researchers. Table 5 shows the number of full-time faculty in the science and engineering departments of doctorate-granting universities. The table also shows total research funds obligated to universities. (The large majority of universities receiving such monies award the PhD.) This table shows that psychologists receive less than average support but more support than social scientists and mathematicians.

RESEARCH APPLICATIONS AND SUCCESS

One reason why psychologists might receive relatively low support is that, either for personal reasons or because of the availability of other funds, they do not apply for federal funds as frequently as others. Recent data provided by NSF suggest that this is not the case. Figure 3 shows, for 1974, the number of proposals received in all NSF programs from scientists of different disciplines and the number of grants awarded. The "success ratio" is lowest in psychology. Other data are available to show that the 1974 data for NSF are not unique. Success ratios in psychobiology since 1951 have

TABLE 4: *Estimate of Federal Applied-Research Dollars Per University Scientist Engaged in Applied Research by Field of Science*

Field of science	Estimated no. of university scientists engaged in applied research in FY 1974[a]	Federal obligations for applied research at universities in FY 1974	Funds per applied-research scientist	Percentage of applied-research scientists receiving federal support[b]
All fields of science	16,800	$933,593,000	$55,571	48
Psychology	2,100	29,716,000	14,150	33
Economics	1,700	13,747,000	8,086	24
Sociology/anthropology	500	13,165,000	26,330	40
Biology	1,000	172,573,000	172,573	50
Medicine	700	461,272,000	658,960	71

Note. Data in Columns 1, 2, and 4 are from the National Science Foundation (1975d for Columns 1 and 4; 1975b, Appendixes C and D, for Column 2).
[a] Based on self-reported applied research as a primary or secondary activity (teaching often reported as primary activity when one choice given) in July 1973.
[b] Self-report.

TABLE 5: *Estimate of Federal Research Dollars Per Full-time University Scientist at Doctorate-Granting Institutions*

Field of employment	No. of full-time scientists in universities awarding the PhD in sciences or engineering in January 1975[a]	Federal obligations for all research performed at universities in FY 1974	Funds per full-time scientist
All fields of science	154,922	$1,882,305,000	$12,150
Psychology	7,220	59,755,000	8,276
Engineering	16,611	157,279,000	9,468
Physical science	14,940	244,370,000	16,357
Environmental science	4,383	131,781,000	30,066
Mathematical science	9,886	58,195,000	5,887
Life science	77,536	1,103,466,000	14,232
Social science	24,346	92,111,000	3,783

Note. Data are from figures published by the National Science Foundation (1975b, 1975c).
[a] Based on institutional responses to a questionnaire.

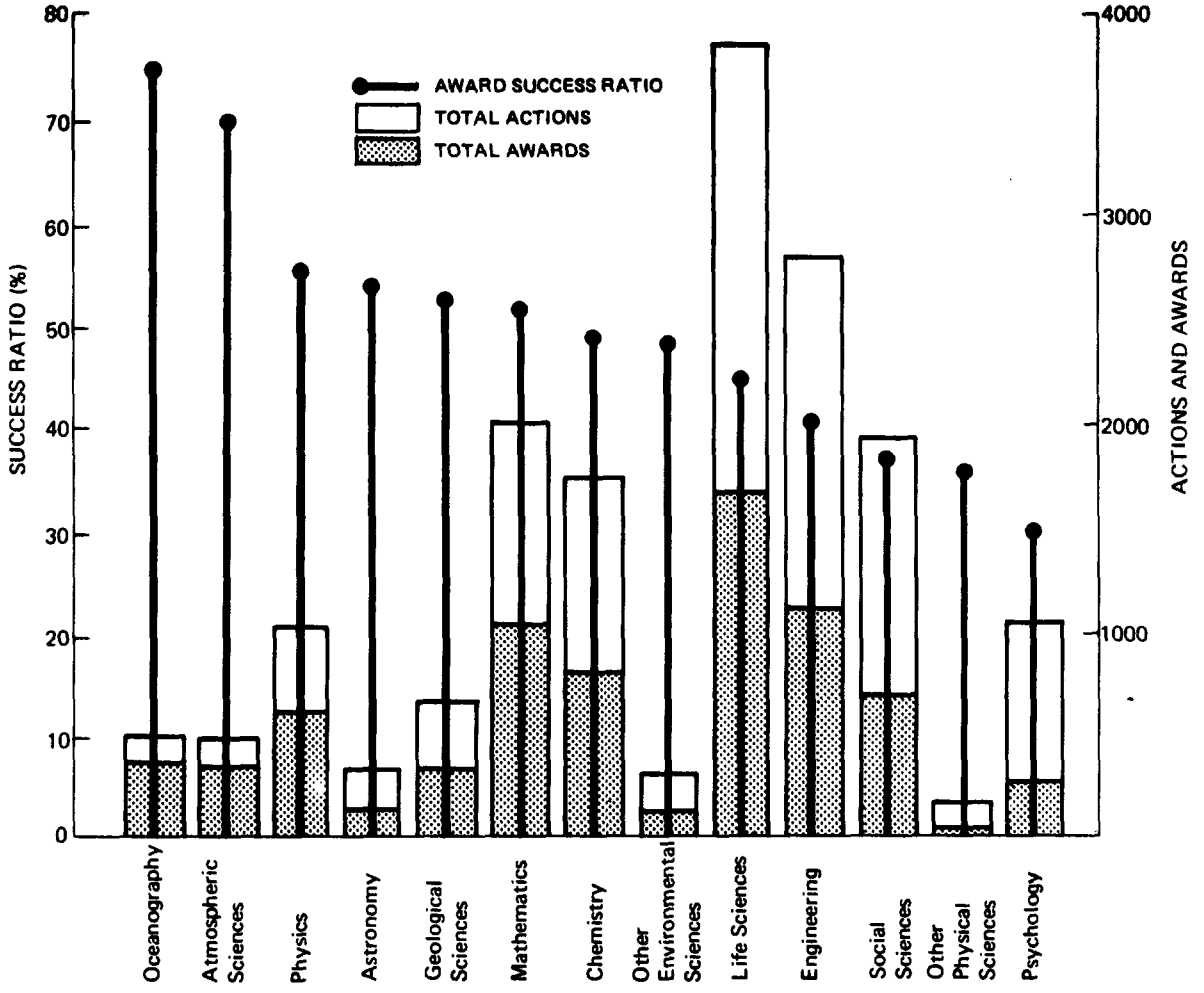
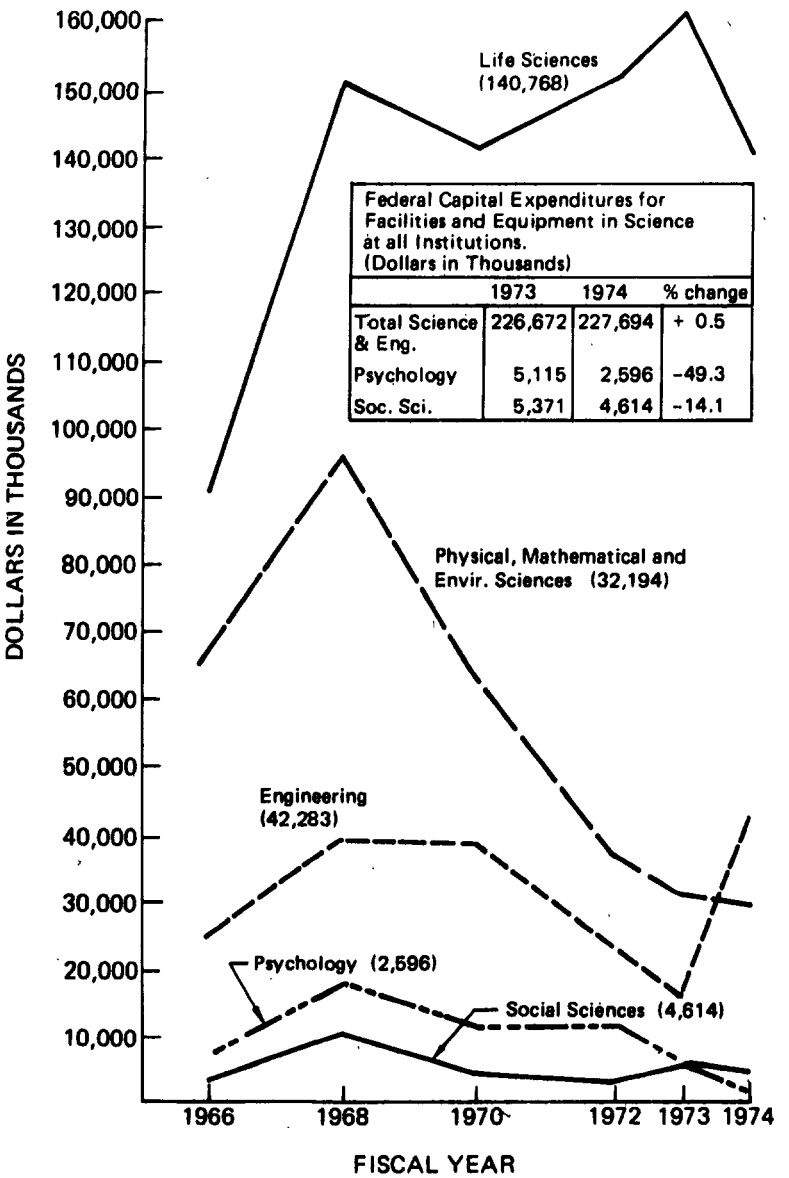


Figure 3. National Science Foundation success ratios in major fields of science, FY 1974 (data are from Administration Directorate, National Science Foundation, Note 2).

averaged 30%. Success ratios in social psychology since it became a separate program in 1970 have averaged 32%. In the social sciences, only sociology with 30% and political science with 31% have experienced success ratios this low. Apparently, the situation is not very different in NIH and the National Institute of Mental Health (NIMH).

COSTS OF RESEARCH AND FUNDING

Perhaps the clearest way to examine whether relative costs of research account for differences in funding is to examine fields that use comparable permanent equipment and laboratory facilities with respect to how much support has been provided for these capital items (the data in previous tables and figures do not include these expenditures). This is not easy to do for psychology because it is such a diverse field; there is probably no comparable discipline. One is forced to make very rough comparisons. Some data are provided in Figure 4 to illustrate expenditures over 9 years for permanent equipment and other capital facilities in universities. Considering inflation, which has caused prices of these items to climb about 25%, no field has done well. But psychology has



Federal Capital Expenditures for Facilities and Equipment in Science at all Institutions. (Dollars in Thousands)

	1973	1974	% change
Total Science & Eng.	226,672	227,694	+ 0.5
Psychology	5,115	2,596	-49.3
Soc. Sci.	5,371	4,614	-14.1

Figure 4. Federal capital expenditures for facilities and equipment in science (data are from National Science Foundation, 1975a).

TABLE 6: *Percentages of Academic Researchers Whose Research in 1974 Was Supported by Federal Funds*

Field	Distinguished or strong departments			All departments		
	All researchers	Young researchers	Senior researchers	All researchers	Young researchers	Senior researchers
All fields	72.4	63.0	76.4	55.9	46.3	60.8
Psychology	58.5	45.8	65.2	43.2	30.7	52.0

Note. These data are based upon a survey (National Science Foundation, 1975e) of department chairmen in 160 doctorate-granting institutions and 15 science departments (biochemistry, biology, botany, chemical engineering, chemistry, economics, electrical engineering, geology, mathematics, microbiology, physics, physiology, psychology, sociology, and zoology). The ratings of the above departments are from Roose and Anderson (1970). "Academic researchers" are faculty who spend 20% or more of their time engaged in research. "Young" researchers are faculty who have held the doctorate for 7 years or less.

declined more than any other field and currently receives slightly fewer funds for facilities and equipment than do the social sciences, which undoubtedly are less "equipment-intensive." Note, however, that these data do not take into account other costs or needs that conceivably could change the picture.

QUALITY OF RESEARCH AND FUNDING

The data on quality of research are not much more informative, but there is evidence that psychologists in highly rated departments are having the same difficulty obtaining funds for their research as are psychologists in not so highly rated departments. Table 6 provides the results of a recent survey, which shows that psychologists in good or excellent academic departments are more likely to be supported than psychologists in departments not so highly rated. Nonetheless, the gap between psychologists and researchers from other disciplines in comparably well rated departments is even greater than the gap between psychologists and other researchers in not so highly rated departments.[2] The argument that psychologists are less qualified than other scientists—and hence deserving of less support—does not account for the relative lack of support they receive at the best institutions.

NONFEDERAL SUPPORT

What happens to researchers in psychology who cannot obtain federal funds? They might be discouraged from doing research at all; they might try again and again for support; or they might scale down their research. Another possibility is that they might request, and receive, support from nonfederal sources such as state and local government, industry, and foundations. The available data suggest that psychologists have been somewhat successful in obtaining nonfederal funding although their total support is not impressive. Table 7 shows trends for federal and nonfederal R&D expenditures in universities. These data illustrate a huge increase in the contribution of nonfederal sources to psychological research, but even so, nonfederal sources contribute less to psychology than to any other discipline shown.

Research Support for Young and Senior Scientists

Every year, the National Academy of Sciences conducts a survey to identify the number of doctoral recipients in science and engineering (the Bureau of the Census also counts scientists but does not consider degree held). The National Academy of Sciences survey data show a high growth rate in psychology (e.g., a 21% increase in doctorates awarded from 1972 to 1974) and a total doctorate-holding population of 29,514 in 1974—the last year for which data are available.[3] Over half of the new psychology doctorate holders in recent years have been planning to enter teaching and research careers. It would therefore not be surprising to find that young, not-yet-established researchers are particularly affected by shortages of funding. That this has been the case is supported by the evidence. First, the survey of department chairmen referenced earlier (see Table 6) indicated that (a) the proportion of faculty investigators whose research was supported by federal funds declined 11% from 1968 to 1974, (b) the proportion of psychology-faculty investigators so supported declined 28% in

[2] The Committee on the Social Sciences in the National Science Foundation (Note 1) found that many excellent researchers were not awarded grants, apparently due to lack of funds.

[3] These data were calculated from information provided by the National Academy of Sciences (Note 3, Note 4, Note 5). It is possible that growth in psychology doctorates is overestimated because new PhD recipients are asked to identify their field rather than the department or school from which they received their degree.

TABLE 7: *Federal and Nonfederal Research and Development Expenditures*[a] *($Thousands) at All Universities in Several Disciplines, FY 1964 and FY 1974*

Field of science	Federal		Nonfederal	
	FY 1964	FY 1974	FY 1964	FY 1974
All fields of science	917,322	2,033,475	332,288	906,530
Psychology	27,572	58,552	1,435	12,456[b]
Economics	10,565	22,413	5,551	25,265
Sociology	8,739	41,252	8,331	15,544
Biology	176,933	370,781	153,505	144,825
Clinical medicine	256,874	540,111	38,612	167,068

Note. Data are from the National Science Foundation (1975a, see Appendix B).
[a] "Expenditures" are funds actually used during a given year, as opposed to "obligations," which are funds awarded in that year.
[b] The Foundation Center in Washington, D.C., collects and stores information about private foundation grants over $5,000. The list for 1974 in behavioral science shows only one $25,000 grant to academic psychologists. In 1975, the list shows two grants totaling $35,000. Apparently, private foundations do not account for a large proportion of nonfederal funds in psychology at universities. (Total behavioral science grants by foundations, including psychiatry, were $152,600 in 1974 and $561,300 in 1975.)

the same period, and (c) the proportion of *young* psychology-faculty investigators supported fell an amazing 46%. No other group surveyed declined in support to the extent that young faculty psychologists did. There is another bit of information too. A staff member at the National Science Foundation (Kruytbosch, Note 6) has recently calculated that the proportion of basic research grants awarded to young investigators (8 or fewer years beyond the PhD) in social psychology fell from 40% in 1965 (when it was combined with sociology) to 13% in 1974.

There are some signs that the experience of senior scientists will be changing too. In the FY 1977 NIMH budget submitted to the Congress, a reversal in agency policy can be seen that will emphasize new grants rather than continuation grants. The current plan is to maintain funding in 1977 for new grants in behavioral science at about 1976 levels (nearly $4 million) but to cut continuation grants from $10.5 million in 1976 to $8.2 million in 1977. The director of the program has stated his intention of eventually reaching a goal of two-thirds new grants ("Budget Spells NIMH Priorities," 1975). This policy might have the effect of discouraging experienced researchers from continuing a successful line of work in order to compete with young researchers for new grants in new areas of study.

Another change in funding that could affect senior scientists in psychology is a recommendation being considered by the National Academy of Sciences' Commission on Human Resources. The Commission may recommend for psychology a shift from predoctoral to postdoctoral support but with no increase in funds (and thus a drop in the number supported). The effect may be to provide a smaller research "labor force" for senior scientists at fewer universities but perhaps a more effective one.

Social Value and Funding

In the physical sciences, medicine, and engineering, claims of social value for research are sometimes supported with reference to technological breakthroughs, number of patents, and commercial use of research products. The social value of the behavioral and social sciences would be seriously underestimated if only this evidence were used. In these sciences, knowledge—as compared with "know how"—is often diffused through scientific publications or reports, which then filter to the public and decision makers through textbooks, teachers, magazines, and newspapers (Committee on the Social Sciences, Note 1). This knowledge may clarify alternatives, lead to better-informed decisions, and change conceptions of problems and solutions rather than solve technical problems. Whether the results of research are used in this manner depends upon political and cultural goals as well as the state of the art.

There is evidence that behavioral and social research has had a demonstrable effect on decision makers at high levels, on thousands of students who have enrolled in behavioral science courses, and on technical development. A recent survey of 204 high government officials produced 575 instances of such social science impact (Caplan, Morrison, & Stambaugh, 1975). The authors' tabulations of citations of disciplines show that 26% of the citations referred to knowledge in "psychology" and "social psychology" and 10% to knowledge in "organizational development and management" (which involves a high percentage of psychologists). The other frequently cited areas were so-

ciology (20%), "interdisciplinary areas" (14%), and behavioral economics (11%). These data suggest that psychological knowledge does not sit on shelves gathering dust. In addition, of course, there is a significant fraction of research in psychology that does result in products, procedures, or technology of direct use. Management techniques, school curricula, medical and mental health therapy, and military training are a few examples of areas in which psychological knowledge has found this kind of application.

Predicting Funding for Psychology

Federal agencies begin planning their research-support budgets at least 3 years in advance, but these plans are not publicly available. They negotiate these budgets with the Office of Management and Budget about 1 year in advance; such negotiations are not made public. It is only when an agency testifies before appropriations and authorization committees of the Congress in the winter and spring preceding the fiscal year, that budgets become public information. Then the process of negotiation and compromise becomes more complicated. The final result is strongly influenced by the particular congressmen who are chairmen of the relevant subcommittees (which are generally different for each agency funding psychology), by the congressmen's staff who actually draft the proposed budgets, and by private negotiations between those staff and agency staff. The process is so complex, and so little is public, that it is difficult to predict accurately the future of research funding or even to track trends in its management.

But it is possible to get a sense of direction by requesting and reading reports from government agencies and from influential scientific and public-interest advisory groups. For example, the kind of R&D currently funded by Research Applied to National Needs (in NSF) and the way it is managed were heavily influenced several years ago by two National Academy of Engineering committee reports. I do not suggest that it is easy for a scientist to obtain or read such reports, but more attention to them and to current trends in funding would perhaps be useful.[4]

[4] For those who wish to review funding and other related data, copies of NSF publications are available from the U.S. Government Printing Office, Washington, D.C. 20402. Bibliography requests and questions may be directed to the Division of Science Resource Studies, National Science Foundation, Washington, D.C. 20550.

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