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ABSTRACT

Research reported dealt with a national survey on the allocation of funds to colleges by the College Science Improvement Program (COSIP). Of 94 colleges eligible to receive COSIP grants, 29 had been awarded grants. Questionnaires were sent to students of the eligible institutions while they were freshmen and again when they were seniors. Institutional characteristics, such as enrollment, selectivity level, percentage of Ph.D.'s on the staff, and number of volumes in the library were also included in the analysis. Analysis of the data led to the correlation of selectivity, faculty quality, and affluence with the institutions receiving a COSIP grant; with the percentage of Ph.D.'s on the staff being most significant. In addition to these characteristics, grant recipients were likely to be nonsectarian liberal arts colleges which were relatively progressive. The students at these schools tended to be male and Protestant with superior academic records. They had high professional aspirations and a strong orientation toward science. (JG)

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# On The Allocation of Federal Funds for Science Education

DAVID E. DREW



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ON THE ALLOCATION OF FEDERAL FUNDS FOR SCIENCE EDUCATION

A Case Study of the NSF College Science Improvement Program

David E. Drew

American Council on Education

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# On the Allocation of Federal Funds for Science Education<sup>1</sup>

## A Case Study of the NSF College Science Improvement Program

Massive Federal expenditures for science research and development have been commonplace since World War II and the spectacular technical success of the Manhattan project. Shortly after the war the case for continued government support of basic science research was made by Vannevar Bush (1945) and others; the major organization which grew out of this Federal concern was the National Science Foundation. Subsequently the late fifties (and the voyage of Sputnik) saw science education become a national priority. That period spawned a wide array of measures in support of science education, e.g., the National Defense Education Act.

The passage of time brought increased governmental concern with monitoring and evaluating federally supported programs and a reluctance to simply underwrite projects with a blank check. Thus, for example, the landmark 1965 Elementary and Secondary Education Act (ESEA) contained measures requiring evaluation of projects it was launching. The present research grew out of a request for this kind of impact evaluation by the directors of a key National Science Foundation program. This NSF unit is the College Science Improvement Program (COSIP) which dispenses millions of dollars each year with the goal of improving undergraduate science education.

The data used in these analyses were derived from the longitudinal research program of the American Council on Education (ACE) Office of Research.

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<sup>1</sup>This research was supported in part by National Science Foundation Grant #GR-89. Janice Peterson and Susan Sharp provided valuable assistance in this study. The manuscript was typed by Melvena Wimbs. James Kellett and Alice Alexander of the National Science Foundation provided extensive information about the College Science Improvement Program.

While the major focus of research in the past using this data bank has been on educational issues, several studies have been performed with these data evaluating the impact of specific projects. These have included analyses of other NSF programs (e.g., Astin, 1969) and studies of the effects of special programs for disadvantaged students (Astin, 1970).

An empirical evaluation of the COSIP logically requires two stages, each becoming in effect a separate study. In the impact research itself it is necessary to control for any initial differences which existed between schools receiving COSIP grants and other schools in the eligible population prior to the awarding of the funds. Identifying these initial differences constitutes Phase 1 and yields considerable information about the kinds of schools which receive COSIP grants. The subsequent analysis of the effects of an influx of COSIP funds upon the students will be Phase 2. This paper reports the results of Phase 1.

#### The College Science Improvement Program

The College Science Improvement Program was launched in 1966 and has as its stated goal ". . .to accelerate the development of the science capabilities of predominantly undergraduate institutions and to enhance their capacity for continuing self-renewal" (National Science Foundation, 1969, p. 90). Between the program's inception and the end of fiscal year 1969, COSIP made 105 grants representing a total amount of over \$18,000,000 to such institutions.<sup>2</sup>

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<sup>2</sup>It should be emphasized that the focus of this study is only upon those schools which received major COSIP institutional grants. In fiscal year 1969, for the first time, NSF also awarded eight interinstitutional grants. These are smaller, special awards, typically given to a consortium consisting of a number of schools. Also excluded were interinstitutional grants awarded to consortia of two-year colleges; all of the schools considered in this research are four-year institutions.

The range of departments which receive funds from COSIP grants is wide and falls into the following NSF categories:

- Biological Sciences
- Chemistry
- Computer Science
- Earth Sciences
- Engineering
- Mathematics
- Physics
- Psychology
- Social Sciences
- Interdisciplinary
- Multidisciplinary

Within any given department the use of the money may vary among the following categories:

- Faculty research and scholarly activities
- Local course and curriculum studies
- Instructional equipment
- Undergraduate student activities
- Other activities

#### The ACE Longitudinal Research Program

As indicated above, the data presented in this research report are a direct product of the Cooperative Institutional Research Program (CIRP) being conducted by the Office of Research of the American Council on Education. Since this program was launched in 1966, over a million undergraduates have completed questionnaires. Work prior to the CIRP program included a prototype study carried out with students who entered college in 1961 and a pilot study of 1965 freshmen. Each fall since 1966, when the full-scale research program was launched, approximately a quarter of a million students from a wide range of colleges and universities have filled out questionnaires containing items about their previous academic experiences, educational and professional aspirations, attitudes, etc. In addition, follow-up questionnaires have been sent to subsamples of each entering cohort at periodic intervals.

This framework makes possible both descriptive profiles and longitudinal studies of undergraduate development. The former are based on a complex set of weighting procedures (Creager, 1968), which lead to national normative reports. These have been produced with respect to entering freshmen (e.g., Creager, Astin, Boruch, Bayer, and Drew, 1969) and at subsequent intervals in the college experience (Bayer, Drew, Boruch, Astin, and Creager, 1970) as well as with respect to specific subgroups of students (e.g., Drew, 1970a). Analytical studies have been conducted with respect to such topics as the dimensions of the college environment (Astin, 1968a) and undergraduates planning a career in medicine (e.g., Drew, 1970b). An accessing system has been established to make these data available to a wide range of social and educational researchers (Bayer, Astin, Boruch, and Creager, 1969); concurrently a series of steps have been taken which assure the confidentiality of the information provided by the research subjects (Astin and Boruch, 1970).

#### Definition of the Sample

Sample definition (and in fact definition of the eligible population) was an important and complex process. In essence it amounted to determining which schools in the ACE Data Bank were eligible institutions in terms of the COSIP definition and, of those, which had received COSIP grants.

The sample of institutions should remain identical from Phase 1 to Phase 2. The impact research (Phase 2) will trace the effect of COSIP grants on the aspirations and performances of the undergraduates. In light of the time periods involved the optimal cohort of students to be studied were those who had entered college in the fall of 1966 (before COSIP was launched).

The 1966 Data Bank included information from students at 307 institutions, data from 251 of which were used in computing the National Freshmen Norms for

that year (Astin, Panos and Creager, 1966). Table 1 contains information about the population, sample, and sample weights used in 1966 broken down by stratification cell or type of institution. Table 2 indicates the actual number of participants in each of several categories of institutions as well as the weighted population estimates within those categories.

The 1966 freshmen received a follow-up questionnaire during December of 1969, their senior year. For an institution to be relevant with respect to this impact research, it must have participated in the follow-up. Thus, the total from the 1966 freshmen sample was reduced to those schools which also were included in the follow-up; this group consisted of 186 institutions.

At this point we had only defined the sample of institutions with respect to the ACE Data Bank. The next task was determining that subset of the above institutions which was eligible to receive a COSIP grant.

The formal statement of institutional eligibility is given in a publication by the National Science Foundation about the College Science Improvement Program.

Eligibility for participation in the College Science Improvement Program is extended to any science baccalaureate-granting institution in the United States or its territories which, during academic years 1961-62 to 1963-64, inclusive, granted not more than 10 Ph.D.'s in the sciences. Although the group of eligible institutions is not otherwise circumscribed, strong preference will be given, at least in the early years of the Program, to those institutions granting 100 or more baccalaureates in science in the 3-year period of 1963-64 to 1965-66, inclusive (or in any later period for which substantiating data are available). An eligible institution may not request support for any academic unit which is the subject of a proposal or a grant under the Foundation's Departmental Science Development Program (National Science Foundation, 1968, p. 4).

In fact the strong preference group referred to above has always been used as the pragmatic definition of eligibility. This, then, became the

basis for the definition of eligibility used in this research. However, some additional refinements were necessary.

Technically the 100 baccalaureates or more should have been given within the most recent 3-year period. NSF officials have determined this by looking at the cover sheets of proposals received and checking with the registrars of the institutions. As a reference list they used information obtained from the Office of Education concerning the period between 1963-64 and 1965-66. (It should be noted that one criterion used by NSF was that once a school was eligible, it remained eligible.) Our research used this list. However, since the information could be superceded by data from the institution in the NSF decision-making process, we made a special review of the eligibility of any school which had applied for a grant. There was no reasonable way to determine the few schools in the population who may also have been eligible, but were not on the basic list. Using these criteria we found that 94 of the ACE Data Bank institutions mentioned above had been eligible to receive COSIP grants. These are listed in Appendix A.

Similar considerations arose in the process of determining which schools received COSIP grants. As the dependent variables were measured in December of 1969, no school could be considered as having received a grant (for purposes of this study) which had not obtained funds prior to this time, i.e., no school could be considered to which the funds had not been sent by fiscal year 1970. Thus, if a school had been awarded a grant in fiscal year 1969, but the money was not to be given to the school until fiscal year 1971, this institution was not considered as having received a grant. Of the eligible institutions 29 had received COSIP grants and are indicated in the Appendix A list. While data from these schools are used in the analyses below, in accordance with the Council's confidentiality policies, information concerning

a specific college is not presented. Five schools had applied for grants but had their proposal denied.<sup>3</sup> These schools remained in the sample of 65 non-recipients.

#### Characteristics of Students and Institutions

Two general sets of variables were examined in the analyses below: one containing institution characteristics and the other containing student data as summarized from the fall 1966 Student Information Form.

The institution characteristics were taken from a file prepared for use in educational research (Creager and Sell, 1969) which contains extensive information about each college. Among the variables used in the analyses below are indicators of whether the school was public or private, male, female or coed, the enrollment, selectivity level, the percentage of Ph.D.s on the staff, the number of volumes in the library, the amount of student fees, the market value of the endowment, the total Federal support per student, etc. The total list of institution variables is presented in Appendix B.

The basic freshman questionnaire is a four page document containing a series of multiple choice items. A copy of the form used in the fall of 1966 is shown in Appendix C. The questionnaire was constructed so that the responses could be recognized by optical scanning equipment and written on a data tape for subsequent computer analysis. The responses to these questions were given by the freshmen after matriculation but before they experienced college,

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<sup>3</sup>In the population the ratio of NSF approvals to denials is approximately 1:1. The small number of denials which appeared in the ACE sample may reflect oversampling of selective schools by the Council. An alternative hypothesis is that colleges which provide poor grant proposals also tend to provide poor (i.e., unacceptable) data for the ACE research.

In addition to the Phase 2 impact study a special additional analysis is planned in which the entire population of grant approvals and denials is compared with respect to a limited number of characteristics. This kind of examination originally was planned with the data discussed above but had to be abandoned in light of the small number of denials among the sample institutions.

i.e., during their orientation period. For each institution a "score" for each variable was obtained which was an indication of the percentage of students who had selected that option. Thus, for example, there were four variables indicating the percentage of students in the school who had attended the following kinds of secondary schools: public, private (denominational), private (non-denominational) and others. In some cases it was necessary to collapse categories in the computer processing but the variables used essentially reflect the contents of the Student Information Form.

#### Data Analyses

The major analysis sought to isolate those factors -- both in terms of institution characteristics and student characteristics -- which were related to subsequent receipt of a COSIP grant. Initially this involved looking at zero-order differences as reflected in the correlation coefficient; following this a more complete analysis was carried out via multiple regression.

#### Institution Characteristics

As a first step all the variables listed in Appendix B were correlated with the dichotomous criterion variable -- receipt of a COSIP grant or not. The results presented in Table 3 include those variables which had significant correlations.<sup>4</sup> Institutions receiving COSIP grants are characterized by a high percentage of Ph.D.s on the faculty, large endowments and selective admissions standards. These schools tend to be private, nonsectarian, liberal arts colleges with relatively few commuters, part-time students, or female students. The comparatively low proportions of freshmen at these institutions

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<sup>4</sup>A few redundant variables were omitted. Thus, only one measure of student selectivity is reported although three other equivalent scales were significantly related to the criterion.

may indicate that COSIP grants are not going to rapidly growing institutions. Alternatively, this could reflect low drop-out rates among grant recipients.

Multiple regression provided a more penetrating analysis. All the institution variables were presented as an independent variable pool using a stepwise regression algorithm, with the same dichotomous criterion variable. These results are summarized in Table 4, which contains all variables which contributed significantly to the prediction of the dependent variable. For each of these independent variables Table 4 indicates the zero-order correlation with the criterion as well as a measure of the importance of its contribution (the F value to remove it from the final equation).

Clearly NSF has been giving COSIP grants to schools with high academic ratings. The factors reflecting this in the regression equation, of course, are the measures of the percentage of Ph.D.s on the staff and of students awarded scholarships. However, while the zero order correlations show a high relationship between receipt of a grant and the size of the school's endowment, the grant recipients were schools which previously had received less money for research than other institutions. Finally, the presence of the "percent male" variable is not surprising in light of the fact that these funds tend to go to the physical sciences which are predominantly male fields.

#### Student Characteristics

The next step in the analyses sought to predict whether or not an institution would receive a COSIP grant on the basis of characteristics of the student body. This concern seemed particularly relevant for several reasons. First, recent research (Astin, 1968b) has demonstrated that the major differential effects of colleges appear to be less a function of institution facilities and wealth than of the characteristics of the entering students. The second reason was the importance of student measures as criteria in the

analyses planned for Phase 2. In this future work we shall want to be sure we have controlled for all student characteristics which differentiated COSIP grant recipients from the rest of the eligible sample.

As indicated above, the institution "score" for each student characteristic was the percentage of the freshmen who checked that item on the questionnaire. Thus each of the independent variables in the analysis below was a number between 0 and 100 percent.

As before, the first step involved examining the correlation coefficients between the student characteristics and the criterion of whether or not the school had received a COSIP grant. The results of this analysis are presented in Table 5. Several questionnaire items e.g., whether or not the student is a twin, whether he expects to marry while in college, etc., have been omitted as they were, at best, indirectly relevant to the present concerns. For each questionnaire item in Table 5 only those options which yielded significant correlations are presented.

The students at COSIP schools were likely to have attended nondenominational private secondary schools and to have maintained a superior academic record. In addition they achieved various other secondary school honors, particularly with respect to science. In fact, there are several indicators of a strong science orientation on the part of the students at these schools. In addition to past achievements, their future majors and careers as well as their objectives all reflect this orientation. Thus, the highest correlations among the major fields is with physical sciences and among the probable career occupations with research scientist. Students at these colleges have lofty educational aspirations and appear to be planning on high-level professional careers. Finally, the profile they present of their college is of a cohesive, progressive school with a considerable amount of academic competition and pressure.

Multiple regression was used to isolate those student characteristics uniquely associated with receipt of a COSIP grant by the college. All items from the Student Information Form (see Appendix C) were used as the independent variable pool. The results are presented in Table 6 which includes any variable which significantly predicted whether or not an institution received a grant. The image which emerges from study of Table 6 is of a relatively progressive college (athletics not emphasized and classes informal). The students tend to be Protestant and to have high educational aspirations, although the exact meaning of the emphasis on the law is unclear. The findings that these students were significantly less likely to have gone to the movies during the past year is difficult to interpret directly. It may simply reflect a tendency by these students to pursue serious extra-curricular activities.

#### Supplementary Analyses.

The preceding analyses completed the major work for Phase 1. However, it seemed valuable to examine the data further to see if there were special factors associated with receipt of a COSIP grant for work in a particular field or for a particular purpose. As indicated above, there were eleven categories of academic fields in which COSIP funds have been awarded. A given institution, of course, could receive funds to be distributed within several of these fields. In coding the data for analysis, we created a series of dichotomous variables indicating whether or not a school received COSIP funds in each of these categories. A similar coding scheme was followed with respect to the purposes for which the money was used (e.g., scientific equipment, etc.).

In the first set of supplementary analyses, each field became a separate dependent variable. The entire battery of institution variables listed in

Appendix B was used as a predictor pool. Table 7 summarizes the results from these analyses.

Equations were not calculated for several fields: computer science, engineering, social sciences, interdisciplinary. The base rate (i.e., the number of schools receiving a grant in each of these categories) was too low to satisfy fundamental statistical assumptions. Inclusion in this analysis required that at least nine schools had received grants in the category.

The findings are mixed and difficult to interpret. The prediction of receipt of a COSIP grant is strongest in the fields of chemistry, physics, and mathematics. As expected the general predictors revealed in the major analysis show their effect again here. The objective of these analyses was to detect new factors uniquely associated with receiving a grant in a particular field above and beyond these general predictors.

The earlier analyses indicated that no region of the country was significantly more likely than others to receive a COSIP grant. However, there appears to be a slight regional bias with respect to the awarding of grants in chemistry and those which are multidisciplinary.

The second set of supplementary analyses predicted the purposes for which COSIP funds were allocated. Separate regression equations were computed in which each of the goals listed earlier in this paper was predicted on the basis of the institution characteristics in Appendix B. Here, the base rate in each of the five categories was sufficient to allow calculation of the equation. The results are summarized in Table 8.

Apparently, institutional policy with respect to automobiles on campus is a good indicator of these phenomena. The finding that schools with unusual calendar plans, as opposed to the usual semester or trimester schedule, are

more likely to receive grants for undergraduate student projects is understandable. These colleges probably have a progressive approach and are more flexible.

#### Summary and Conclusions

This research drew upon the ACE data bank in an analysis of the characteristics of institutions which were the recipients of grants from the NSF College Science Improvement Program. The sample consisted of 94 colleges which were eligible to receive COSIP grants; of these 29 had been awarded grants. Multiple regression equations were computed in which both characteristics of the institutions and of the student body were used to predict subsequent receipt of a COSIP grant by the school. Supplementary analyses were carried out exploring the predictors of a grant within a particular field or for a particular purpose.

The ability to predict the dependent variable (as reflected in the multiple  $R$ ) was respectable, but far from perfect. That is, even with a large battery of predictor variables, one cannot entirely account for the decisions made. In part, this may be a reflection of a rather vague NSF definition of the criteria upon which the grants were awarded. The evaluation standards set forth in one of their publications are as follows:

"Primary consideration will be given to the degree of academic improvement to be expected if the proposed project is supported. Each individual activity for which support is requested (as well as the improvement plan as a whole) will be examined in the light of the question: How and to what extent will it improve the quality of science education received by the students? Support in order of merit to the extent of available funding is the rule, except that, in cases of substantially equal merit, consideration will be given to such other factors as disciplinary and geographical balances." (National Science Foundation, 1968, p. 8)

Analyses of the data led to the following profile of a grant recipient school. Selectivity, faculty quality and affluence, correlated with each other in higher education, appear also to be related to receiving a COSIP grant. Of all institution characteristics the percentage of Ph.D.s on the staff was most significantly related to the criterion. This is intriguing inasmuch as the COSIP literature stresses that institutions may want to upgrade academic science through improvement of teaching. This finding may also be related to evaluation procedures which include examining the competence of the faculty members involved.

In the case of many COSIP grants the institution is expected to make a contribution itself. This may be one factor which is related to the affluence of grant recipients. Also it may well be that only those colleges with heavy endowments can afford the luxury of maintaining personnel whose task it is to aid in writing "creative proposals." Finally, while grant recipients tend to be more affluent institutions than nonrecipients, they are significantly lower in the category of sponsored research.

In addition to these characteristics, grant recipients were likely to be nonsectarian liberal arts colleges which were relatively progressive (informal classes, athletics not emphasized). The students at these schools tended to be male and Protestant with superior academic records. They had high professional aspirations and a strong orientation toward science.

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TABLES

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Table 1

Final 1966 ACE Sample and Weights Used in Computing National Norms

Stratification Cell For Sampling	Number of Institutions Participants:			Cell Weights* Applied To Data From:	
	Popu- lation	Total	Used In Norms	Men	Women
<u>2-Year Public Colleges</u>					
Enrollment:					
1. less than 500	111	6	3	25.667	23.477
2. 500-999	99	3	3	36.844	32.476
3. 1000-2499	108	6	5	22.143	21.778
4. 2500-4999	40	4	4	8.773	9.305
5. 5000 or more	35	5	4	7.347	6.993
<u>2-Year Private Colleges</u>					
Enrollment:					
6,7. less than 1000	173	6	5	45.436	25.136
8,9. 1000 or more	27	5	5	4.567	6.260
<u>4-year Colleges</u>					
Expenditures:**					
10. Unknown	254	9	9	3.030	3.219
11. less than \$750	109	23	21	7.468	7.392
12. \$750-999	234	20	15	16.717	15.367
13. \$1000-1249	236	23	19	13.676	14.948
14. \$1250-1499	160	26	23	6.210	7.978
15. \$1500-1749	78	19	19	3.915	5.483
16. \$1750-1999	51	24	21	3.990	2.583
17. \$2000-2249	21	9	5	8.916	5.850
18. \$2250-2499	20	10	8	8.916	2.308
19. \$2500 or more	39	21	18	2.033	2.405
<u>Universities</u>					
Expenditures:**					
20. Unknown	14	3	2	8.099	7.427
21. less than \$750	10	4	4	2.141	2.407
22. \$750-999	7	4	3	1.715	2.185
23. \$1000-1249	18	6	5	2.651	3.477
24. \$1250-1499	24	11	9	2.643	2.619
25. \$1500-1749	11	5	5	2.872	2.522
26. \$1750-1999	24	15	10	2.373	2.150
27. \$2000-2249	20	17	12	1.688	1.694
28. \$2250-2499	13	5	4	2.453	3.522
29. \$2500 or more	32	18	10	3.341	3.554
Totals:	1,968	307	251		

\* Ratio between the number of 1965 first-time students enrolled in all colleges and the number of 1965 first-time students enrolled at colleges in the ACE sample.

\*\*Per student expenditures for educational and general purposes.

Table 2  
Institutions and Students Used in Computing the  
1966 Weighted National Norms

	Number Used In Norms	Number of 1966 Actual Participants	Number of 1966 Entering Freshmen*	
			Weighted Number	Totals % Men
All Institutions	251	206,865	1,163,123	54.3
All Two-Year Colleges	29	22,901	290,072	58.2
All Four-Year Colleges	158	61,433	527,320	49.5
All Universities	64	122,531	345,732	58.2

\* First-time, full-time.

Table 3

Correlations Between Receipt of a COSIP Grant and Institution  
Characteristics  
(N = 94 Institutions)

	<u>Correlation Coefficient*</u>
% Ph.D. on Staff	.387
Endowment (market) Per Student	.372
Total Revenues Per Student (Affluence)	.292
% Full-Time of Total Enrollment	.285
% of Full-Time Enrollment Awarded Scholarships	.273
Roman Catholic College	-.256
Selectivity Level	.234
Aid Per Student	.232
Private-Nonsectarian College	.219
Residence Hall Capacity (% of Full-Time Enrollment)	.205
Autos Allowed	-.202
Liberal Arts College	.194
% Full-Time Male of Total Enrollment	.192
% Freshmen of Full-Time Enrollment	-.189
% Resident of Total Enrollment	.182
Fees Per Student	.181
Academic Science Per Student 1963	.175

\*  $r_{.05} = .17$ ;  $r_{.01} = .24$ .

Table 4  
Prediction of Receipt of a COSIP Grant on the  
Basis of Institution Characteristics  
(N = 94 Institutions)

Multiple R = .549	<u>Sign</u>	<u>F Ratio In The Final Equation</u>	<u>Zero-Order Correlation</u>
% Ph.D. On Staff	+	22.027	.387
Sponsored Research	-	7.868	-.119
% Full-Time Male of Total Enrollment	+	6.359	.192
% of Full-Time Enrollment Awarded Scholarships	+	6.307	.273

Table 5

Correlations Between Receipt of a COSIP Grant and  
Selected Student Characteristics  
(N = 94 Institutions)

	<u>Correlation Coefficient*</u>
Type of Secondary School	
Private (Denominational)	-.262
Private (Nondenominational)	.256
<hr/>	
Average Grade in High School	
A or A+	.247
A-	.281
B-	-.234
C+	-.240
<hr/>	
Secondary School Achievements	
Elected President of a Student Organization	.295
Had Original Writing Published	.273
Participated in NSF Summer Program	.303
Placed in a State/Regional Science Contest	.304
Was a Member of a Scholastic Honor Society	.297
<hr/>	
Highest Academic Degree Planned	
Bachelors Degree (B.A., B.S.)	-.336
Ph.D. or ED.D	.382
M.D., D.D.S., or D.V.M.	.217
LL.B. or J.D.	.278
<hr/>	
Probable Major Field of Study	
Education	-.197
History, Political Science	.237
Mathematics or Statistics	.194
Physical Sciences	.274
Pre-Professional	.230
<hr/>	
Probable Career Occupation	
College Professor	.294
Doctor (M.D.)	.257
Educator (Secondary)	-.234
Elementary Teacher	-.243
Health Professional (Non-M.D.)	-.208
Lawyer	.295
Research Scientist	.306
Undecided	.197
<hr/>	
Objectives Considered To Be Essential or Very Important	
Making a Theoretical Contribution to Science	.186
Writing Original Works	.230
Never Being Obligated to People	-.176

Table 5  
(Continued)

	<u>Correlation Coefficient*</u>
<b>Major Sources of Financial Support</b>	
<b>During Freshman Year</b>	
Employment During Summer	-.195
Scholarship	.221
G.I. Bill	-.180
Personal Savings	-.231
Parental Aid	.255
Federal Government	-.259
Commercial Loan	-.221
<hr/>	
<b>Very Descriptive of the Atmosphere of the</b>	
<b>College</b>	
Intellectual	.310
Practical-Minded	-.318
Realistic	-.161
Liberal	.202
<hr/>	
<b>Applies to this College (Yes)</b>	
Students Under Great Pressure to get High Grades	.197
Students' Academic Calibre High	.221
There is Keen Competition for Grades	.197
I Felt Lost When I First Came to this Campus	-.177
Classes Are Usually Informal	.395

\*  $r_{.05} = .17$ ;  $r_{.01} = .24$ .

Table 6

Prediction of Receipt of a COSIP Grant on the Basis  
of Student Characteristics  
(N = 94 Institutions)

Multiple R = .585	<u>Sign</u>	<u>F Ratio</u> <u>In The Final Equation</u>	<u>Zero-Order</u> <u>Correlation</u>
% of Students Indicating That:			
Classes Are Usually Informal	+	14.714	.395
They Are Protestant	+	10.605	.306
Atheletics Are Over-Emphasized	-	6.422	-.150
They Aspire to an LL. B. or J.D. Degree	+	6.108	.278
They Went to the Movies Frequently	-	5.144	-.074

Table 7

Prediction of Receipt of a COSIP Grant in a Particular Field  
on the Basis of Institution Characteristics  
(N = 94 Institutions)

	<u>Sign</u>	<u>F Ratio In The Final Equation</u>	<u>Zero-Order Correlation</u>
<u>Biological Sciences (R = .379)</u>			
Endowment (market) Per Student	+	15.402	.379
<u>Chemistry (R = .578)</u>			
Research Funds Per Student	-	10.332	-.130
% of Full-Time Enrollment Awarded Scholarships	+	10.194	.310
Endowment (market) Per Student	+	9.850	.392
Academic Science Per Student 1963	+	6.351	.104
College in Southeast Region	+	5.916	.226
<u>Earth Sciences (R = .435)</u>			
Endowment (book) Per Student	+	9.150	.278
Unusual or Unknown Calander Plans	+	5.377	.286
Research Funds Per Student	-	5.127	-.191
<u>Mathematics (R = .522)</u>			
Endowment (market) Per Student	+	26.301	.431
Research Funds Per Student	-	6.494	-.169
% Baccalaureates on Staff	-	4.674	-.171
<u>Physics (R = .564)</u>			
Endowment (market) Per Student	+	34.781	.474
Fees Per Student	-	9.672	-.009
% Full-Time of Total Enrollment	+	4.755	.224
<u>Psychology (R = .382)</u>			
R & D Plant Per Student 1966	+	8.748	.237
Research Funds Per Student	-	6.275	-.153
% of Full-Time Enrollment Awarded Scholarships	+	4.731	.169
<u>Multidisciplinary (R = .332)</u>			
Average Freshmen SAT (Verbal + Mathematics) Score	+	10.879	.254
College in Southeast Region	+	4.627	.059

Table 8

Prediction of Receipt of a COSIP Grant for a Particular Purpose  
on the Basis of Institution Characteristics  
(N = 94 Institutions)

	<u>Sign</u>	<u>F Ratio</u> <u>In The Final Equation</u>	<u>Zero-Order</u> <u>Correlation</u>
<u>Faculty Research &amp; Scholarly</u> <u>Activities (R = .362)</u>			
Endowment (market) Per Student	+	7.343	.277
Automobiles Allowed	-	5.687	-.246
<u>Local Course and Curriculum</u> <u>Studies (R = .534)</u>			
Endowment (market) Per Student	+	16.118	.366
Automobiles Allowed	-	10.122	-.290
% Baccalaureates on Staff	-	4.883	-.183
Number of Periodicals in the Library	+	4.231	.186
<u>Instructional Scientific</u> <u>Equipment (R = .444)</u>			
Endowment (market) Per Student	+	6.367	.310
Automobiles Allowed	-	5.080	-.256
% of Full-Time Enrollment Awarded Scholarships	+	4.797	.306
<u>Undergraduate Student Activities</u> <u>(R = .388)</u>			
Endowment (book) Per Student	+	8.341	.308
Unusual or Unknown Calendar Plans	+	5.922	.269
<u>Other Activities (R = .318)</u>			
Endowment (market) Per Student	+	10.328	.318

APPENDIX A

The Sample of COSIP-Eligible Institutions

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The Sample of COSIP-Eligible Institutions

Adrian College  
Alabama A & M College  
Allegheny College  
Amherst College \*  
Aquinas College  
Augsburg College  
Austin College  
Bates College  
Beloit College \*  
Berea College \*  
Bowdoin College  
Bradley University  
California State College - Fullerton  
Carleton College \*  
Carroll College  
Chatham College  
Colby College  
College of Mount Saint Vincent  
College of New Rochelle  
Connecticut College  
Dartmouth College  
Davis & Elkins College \*  
Delaware Valley College of Science and Agriculture  
Depauw University  
Dickinson College \*  
Earlham College \*  
Emory & Henry College \*  
Fairmount State College  
Fisk University \*  
Franklin & Marshall College \*  
General Motors Institute  
Gettysburg College \*  
Grinnell College \*  
Guilford College  
Hamline University  
Harding College - Main Campus  
Harvey Mudd College \*  
Hollins College \*  
Johnson C. Smith University  
Lake Forest College  
Lebanon Valley College  
Louisiana Polytechnic Institute \*  
Loyola University - Los Angeles - Main Campus  
MacMurray College \*  
Marietta College  
Mary Baldwin College  
Miami University - Oxford Campus \*  
Middlebury College \*  
Mills College  
Monmouth College \*  
Montana State University  
Morehouse College \*  
Morris Harvey College  
Mount Holyoke College \*

Nazareth College of Rochester  
Newark College of Engineering  
Newton College of the Sacred Heart  
Northland College  
Oberlin College \*  
Occidental College \*  
Parsons College  
Pratt Institute  
Rollins College - Main Campus (Fla.)  
Saint John Fisher College Inc. (N.Y.)  
Saint Joseph College - Main Campus (Ind.)  
Saint Norbert College (Wisc.)  
Springfield College (Mass.)  
Spring Hill College  
SUNY - Cortland  
SUNY - Osewego  
SUNY - Potsdam  
SUNY - Stony Brook  
Swarthmore College  
Sweet Briar College  
Talladega College (Ala.)  
Texas Christian University  
Trinity College (D.C.)  
University of Detroit  
University of the Redlands \*  
University of South Carolina - Main Campus  
University of Vermont & State Agriculture College\*  
Valparaiso University  
Vassar College  
Virginia Military Institute  
Virginia Union University  
Washington & Lee University \*  
Wellesley College  
Wesleyan College  
Western Illinois University  
Wheaton College \*  
Whitman College  
Williams College \*  
Wittenberg University \*  
Wofford College

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\* COSIP Grant Recipients

APPENDIX B

Institution Characteristics Used in the Analyses

33/34

American Council on Education  
 One Dupont Circle  
 Washington, D.C. 20036

Office of Research  
 TAPE LAYOUT SHEET

NAME OF STUDY Research Institutional File DATE November 1, 1969  
 REEL NO. A189\* LABEL None NO. OF CASES 2,319  
 TAPE CHARACTERISTICS Unblocked, 556 bpi. BCD Tape (564 Characters)  
 DATA Selected Institutional Data in Form for Research Use

1		51	4-year college	2/1
2		52	2-year college	2/1
3	1968 ACE#	53	Male	2/1
4		54	Female	2/1
5		55	Coed.	2/1
6	1967 ACE#	56	Northeast	
7		57	Midwest	2/1
8		58	Southeast	
9		59	West & Southwest	
10		60	Liberal Arts	
11		61	Teachers	
12	1966 ACE#	62	Independent Technical	
13		63	Religious	
14		64	Independent Professional	2/1
15	USOE State Code	65	Jr. College	
16		66	2-year Technical	
17		67	2-year Semiprofessional	
18	USOE Institution # Within State	68	Arts & Music School	
19		69	Public Control	
20		70	Private-Nonsectarian	2/1
21	Stratification Cell	71	Roman Catholic	
22		72	Other Sectarian	
23		73	1966 Enrollment Code	
24		74		
25		75		
26		76	Generated Total Enrollment 1967	
27		77		
28		78		
29		79		
30		80	1967 Enrollment Code	
31	Name of Institution	81		
32		82		
33		83	Total Full-Time Enrollment, 1967	
34		84		
35		85		
36		86		
37		87		
38		88		
39		89	Total Resident Enrollment	
40		90		
41		91		
42		92		
43		93	% Full-Time of Total Enrollment	99 = 99-100
44		94		
45		95	% Male of Total Enrollment	99 = 99-100
46	USOE Control Code	96		
47		97	% Resident of Total Enrollment	99 = 99-100
48	Race (Negro = 2, White = 1)	98		
49	Control (private = 2, public = 1)	99	% First-Time, Full-Time of Total Enrollment	99 = 99-100
50	University = 2, 1 = otherwise	100		

\* Stratification cell means supplied in tape A189 for missing data in fields indicated.  
 Tape A151 is the same except blanks for missing data.

American Council on Education  
 One Dupont Circle  
 Washington, D.C. 20036

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REEL NO. A189

LABEL \_\_\_\_\_

Office of Research

TAPE LAYOUT SHEET

101	% Freshmen of Total Enrollment	151	Percent Associates on Staff	**
102		152		
103	% Full-Time Male of Total Enrollment	153		
104		154	Annual Tuition (Out-of-State)	**
105	% Male of Full-Time Enrollment	155		
106		156		
107	% Resident of Full-Time Enrollment	157	% of Full-Time Enrollment Awarded Scholarships	**
108		158		
109	% Freshmen of Full-Time Enrollment	159	% of Full-Time Enrollment Given Loans	**
110		160		
111	% Full-Time of Resident Enrollment	161	% of Full-Time Enrollment Given Jobs	**
112		162		
113	% Male of Resident Enrollment	163	% of Full-Time Enrollment Given Aid	**
114		164		
115	% Undergraduate of Resident Enrollment	165	% Foreign Students of Full-Time Enrollment	**
116		166		
117	% Post-baccalaureates of Resident Enrollment	167	% of Full-Time Enrollment - Residence Hall Capacity	**
118		168		
119	Selectivity Level U = 0	169	Autos Allowed 2/1	
120	ACT Score (1-35) U = 19	170		
121		171		
122	NMSQT Composite (1-165) U = 88	172	No. Volumes in Library $\div 100$	**
123		173		
124		174		
125		175		
126	SAT V + M (400-1600) U = 850	176		
127		177	No. of Periodicals in Library	**
128		178		
129	Semester	179		
130	Trimester	180		
131	Quarter	181		
132	Other or unknown	182	Student Fees $\div 100$	**
133	SAT known to be required	183		
134	CEEB known to be required	184		
135	ACT known to be required	185		
136	B average or better in high school	186		
137	Chapel attendance known to be required	187		
138		188	Government Appropriations $\div 100$	**
139	Generated Staff Total	189		
140	(sum of 5 staff degree fields)	190		
141		191		
142		192		
143	Percent Ph.D. on Staff	193		**
144		194	Sponsored Research $\div 1000$	**
145	Percent Master's Degree on Staff	195		
146		196		
147	Percent Baccalaureates on Staff	197		**
148		198		
149	Percent Professional Degree on Staff	199	Student Aid $\div 1000$	**
150		200		

\*\* Stratification cell means supplied for missing data.

American Council on Education  
 One Dupont Circle  
 Washington, D.C. 20036

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REEL NO. A189

LABEL \_\_\_\_\_

Office of Research

TAPE LAYOUT SHEET

201	Student aid (continued)	251		
202		252	Endowment (Market) per Student	**
203		253		
204	Total Revenues $\div$ 1000	254		
205		255	Book Value of Physical Plant	**
206		256	per Student	**
207		257		
208		258		
209		259	Affluence Code	**
210	Book Value of Endowment $\div$ 1000	260		
211		261	Total Federal Support per	
212		262	Student 1966	
213		263		
214		264		
215	Market Value of Endowment $\div$ 1000	265		
216		266	Academic Science Support per	
217		267	Student 1966	
218		268		
219		269		
220		270		
221	Book Value of Buildings and	271		
222	Equipment $\div$ 1000	272	R&D per Student 1966	
223		273		
224		274		
225		275		
226		276		
227		277	R&D Plant per Student 1966	
228	Fees per Student	278		
229		279		
230		280		
231	Appropriations per Student	281		
232		282	Total Federal Support per Student	
233		283		
234		284		
235		285		
236	Research Funds per Student	286		
237		287	Academic Science per Student 1963	
238		288		
239		289		
240	Aid per Student	290		
241		291		
242		292	R&D per Student 1963	
243		293		
244	(Total Revenues per Student) $\div$ 10	294		
245	(affluence)	295		
246		296		
247		297	R&D Plant per Student 1963	
248	Endowment (Book) per Student	298		
249		299		
250		300	Beginning of Degree Fields; Group 01	

APPENDIX C

1966 Student Information Form

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6. Do you have any concern about your ability to finance your college education? (Mark one)

- None (I am confident that I will have sufficient funds).....
- Some concern (but I will probably have enough funds).....
- Major concern (not sure I will be able to complete college).....

7. Through what source do you intend to finance the first year of your undergraduate education?

(Mark one for each item)

- |  |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|
|  | <i>Major Source</i>   | <i>Minor Source</i>   | <i>Not a Source</i>   |
| Employment during college.....           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Employment during summer.....            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scholarship.....                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G. I. Bill.....                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Personal savings.....                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tuition deferment loan from college..... | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Parental aid.....                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Federal government.....                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Commercial loan.....                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

8. What is your racial background? (Mark one)

- Caucasian.....
- Negro.....
- American Indian.....
- Oriental.....
- Other.....

9. What is the highest level of formal education obtained by your parents? (Mark one in each column)

- |                           |                       |                       |
|---------------------------|-----------------------|-----------------------|
|                           | Father                | Mother                |
| Grammar school or less .. | <input type="radio"/> | <input type="radio"/> |
| Some high school.....     | <input type="radio"/> | <input type="radio"/> |
| High school graduate....  | <input type="radio"/> | <input type="radio"/> |
| Some college.....         | <input type="radio"/> | <input type="radio"/> |
| College degree.....       | <input type="radio"/> | <input type="radio"/> |
| Postgraduate degree ..... | <input type="radio"/> | <input type="radio"/> |

10. What is your best estimate of the total income last year of your parental family (not your own family if you are married)? Consider annual income from all sources before taxes.

- |  |  |
|--|--|
| Less than \$4,000... <input type="radio"/> | \$15,000-\$19,999... <input type="radio"/> |
| \$4,000-\$5,999... <input type="radio"/>   | \$20,000-\$24,999... <input type="radio"/> |
| \$6,000-\$7,999... <input type="radio"/>   | \$25,000-\$29,999... <input type="radio"/> |
| \$8,000-\$9,999... <input type="radio"/>   | \$30,000 or more... <input type="radio"/>  |
| \$10,000-\$14,999... <input type="radio"/> |  |

11. Mark one in each column below:

- |                     |                                   |                                   |
|---------------------|-----------------------------------|-----------------------------------|
|                     | Religion in Which You Were Reared | Your Present Religious Preference |
| Protestant.....     | <input type="radio"/>             | <input type="radio"/>             |
| Roman Catholic..... | <input type="radio"/>             | <input type="radio"/>             |
| Jewish.....         | <input type="radio"/>             | <input type="radio"/>             |
| Other.....          | <input type="radio"/>             | <input type="radio"/>             |
| None.....           | <input type="radio"/>             | <input type="radio"/>             |

12. In deciding where to go to college, through what source did this college first come to your attention?

(Mark one)

- Relative.....
- Friend.....
- High school counselor or teacher...
- Professional counseling or college placement service.....
- This college or a representative from this college.....
- Other source.....
- I cannot recall.....

13. To what extent do you think each of the following describes the psychological climate or atmosphere at this college?

(Mark one answer for each item)

- |                       |                         |                       |                               |
|-----------------------|-------------------------|-----------------------|-------------------------------|
|                       | <i>Very Descriptive</i> | <i>In Between</i>     | <i>Not at all Descriptive</i> |
| Intellectual.....     | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Snobbish.....         | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Social.....           | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Victorian.....        | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Practical-minded..... | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Warm.....             | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Realistic.....        | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |
| Liberal.....          | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>         |

14. Answer each of the following as you think it applies to this college:

- |   |                       |                       |
|---|-----------------------|-----------------------|
|   | Yes                   | No                    |
| The students are under a great deal of pressure to get high grades.....   | <input type="radio"/> | <input type="radio"/> |
| The student body is apathetic and has little "school spirit".....         | <input type="radio"/> | <input type="radio"/> |
| Most of the students are of a very high calibre academically.....         | <input type="radio"/> | <input type="radio"/> |
| There is a keen competition among most of the students for high grades .. | <input type="radio"/> | <input type="radio"/> |
| Freshmen have to take orders from upperclassmen for a period of time ...  | <input type="radio"/> | <input type="radio"/> |
| There isn't much to do except to go to class and study.....               | <input type="radio"/> | <input type="radio"/> |
| I felt "lost" when I first came to the campus.....                        | <input type="radio"/> | <input type="radio"/> |
| Being in this college builds poise and maturity.....                      | <input type="radio"/> | <input type="radio"/> |
| Athletics are overemphasized.....   | <input type="radio"/> | <input type="radio"/> |
| The classes are usually run in a very informal manner.....                | <input type="radio"/> | <input type="radio"/> |
| Most students are more like "numbers in a book".....                      | <input type="radio"/> | <input type="radio"/> |

15. Are you:

- An only child (Mark and skip to number 20)
- The first-born (but not an only child) ....
- The second-born.....
- The third-born.....
- Fourth (or later) born.....

16. How many brothers and sisters now living do you have? (Mark one)

- None (Mark and skip to number 20).....
- 1 2 3 4 5 6 7 8 or more
- 

17. Mark one circle for each of your brothers and sisters between the ages of 13 and 23

- |          |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|          | 13                    | 14                    | 15                    | 16                    | 17                    | 18                    | 19                    | 20                    | 21                    | 22                    | 23                    |
| Brothers | <input type="radio"/> |
| Sisters  | <input type="radio"/> |

18. Are you a twin? (Mark one)

- No, (Mark and skip to number 20)..
- Yes, identical.....
- Yes, fraternal same sex.....
- Yes, fraternal opposite sex.....

19. Is your twin attending college?

- No.....
- Yes, the same college.....
- Yes, a different college...

20. Mark one in each column:

Your current home state  
Your birthplace  
Your father's birthplace  
Your mother's birthplace

Alabama.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alaska.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arizona.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arkansas.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
California.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colorado.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connecticut.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delaware.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. C.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Florida.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Georgia.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hawaii.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Idaho.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Illinois.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indiana.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Iowa.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kansas.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kentucky.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Louisiana.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maine.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maryland.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Massachusetts.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Michigan.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Minnesota.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mississippi.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missouri.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Montana.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nebraska.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nevada.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Hampshire.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Jersey.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Mexico.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New York.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
North Carolina.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
North Dakota.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ohio.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oklahoma.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oregon.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pennsylvania.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rhode Island.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
South Carolina.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
South Dakota.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tennessee.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Texas.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utah.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vermont.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Virginia.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Washington.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
West Virginia.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wisconsin.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wyoming.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Latin America.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Europe.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Africa.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asia.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Below is a list of 66 different undergraduate major fields grouped into general categories. Mark only three of the 66 fields as follows:

- ① First choice (your probable major field of study).
- ② Second choice.
- ③ The field of study which is least appealing to you.

Arts and Humanities

- Architecture..... ① ② ③
- English (literature).... ① ② ③
- Fine arts..... ① ② ③
- History..... ① ② ③
- Journalism (writing) ... ① ② ③
- Language (modern) .... ① ② ③
- Language (other)..... ① ② ③
- Music..... ① ② ③
- Philosophy..... ① ② ③
- Speech and drama .... ① ② ③
- Theology..... ① ② ③
- Other..... ① ② ③

Biological Science

- Biology (general)..... ① ② ③
- Biochemistry..... ① ② ③
- Biophysics..... ① ② ③
- Botany..... ① ② ③
- Zoology..... ① ② ③
- Other..... ① ② ③

Business

- Accounting..... ① ② ③
- Business admin..... ① ② ③
- Electronic data processing..... ① ② ③
- Secretarial studies .... ① ② ③
- Other..... ① ② ③

Engineering

- Aeronautical..... ① ② ③
- Civil..... ① ② ③
- Chemical..... ① ② ③
- Electrical..... ① ② ③
- Industrial..... ① ② ③
- Mechanical..... ① ② ③
- Other..... ① ② ③

Physical Science

- Chemistry..... ① ② ③
- Earth science..... ① ② ③
- Mathematics..... ① ② ③
- Physics..... ① ② ③
- Statistics..... ① ② ③
- Other..... ① ② ③

Professional

- Health Technology (medical, dental, laboratory)..... ① ② ③
- Nursing..... ① ② ③
- Pharmacy..... ① ② ③
- Pre dentistry..... ① ② ③
- Prelaw..... ① ② ③
- Premedical..... ① ② ③
- Preveterinary..... ① ② ③
- Therapy (occupat., physical, speech).. ① ② ③
- Other..... ① ② ③

Social Science

- Anthropology..... ① ② ③
- Economics..... ① ② ③
- Education..... ① ② ③
- History..... ① ② ③
- Political science (government, int. relations)..... ① ② ③
- Psychology..... ① ② ③
- Social work..... ① ② ③
- Sociology..... ① ② ③
- Other..... ① ② ③

Other Fields

- Agriculture..... ① ② ③
- Communications (radio, T. V., etc.)... ① ② ③
- Electronics (technology)..... ① ② ③
- Forestry..... ① ② ③
- Home economics.... ① ② ③
- Industrial arts..... ① ② ③
- Library science .... ① ② ③
- Military science .... ① ② ③
- Physical education and recreation..... ① ② ③
- Other (technical) ... ① ② ③
- Other (nontechnical)... ① ② ③
- Undecided..... ① ② ③

22. Probable Career Occupation

Note:

- Make only three responses, one in each column
- ① First Choice
  - ② Second Choice
  - ③ Least Appealing

- Accountant or actuary..... ① ② ③
- Actor or entertainer..... ① ② ③
- Architect..... ① ② ③
- Artist..... ① ② ③
- Business (clerical)..... ① ② ③
- Business executive (management, administrator) .... ① ② ③
- Business owner or proprietor..... ① ② ③
- Business salesman or buyer..... ① ② ③
- Clergyman (minister, priest)..... ① ② ③
- Clergy (other religious)..... ① ② ③
- Clinical psychologist..... ① ② ③
- College teacher..... ① ② ③
- Computer programmer..... ① ② ③
- Conservationist or forester..... ① ② ③
- Dentist (including orthodontist) ... ① ② ③
- Dietitian or home economist..... ① ② ③
- Engineer..... ① ② ③
- Farmer or rancher ... ① ② ③
- Foreign service worker (including diplomat)..... ① ② ③
- Housewife..... ① ② ③
- Interior decorator (including designer)..... ① ② ③
- Interpreter (translator)..... ① ② ③
- Lab technician or hygienist..... ① ② ③
- Law enforcement officer..... ① ② ③
- Lawyer (attorney)..... ① ② ③
- Military service (career)..... ① ② ③
- Musician (performer, composer) ... ① ② ③
- Nurse..... ① ② ③
- Optometrist..... ① ② ③
- Pharmacist..... ① ② ③
- Physician..... ① ② ③
- School counselor..... ① ② ③
- School principal or superintendant ① ② ③
- Scientific researcher..... ① ② ③
- Social worker..... ① ② ③
- Statistician..... ① ② ③
- Therapist (physical, occupational, speech)..... ① ② ③
- Teacher (elementary)..... ① ② ③
- Teacher (secondary)..... ① ② ③
- Veterinarian..... ① ② ③
- Writer or journalist..... ① ② ③
- Skilled trades..... ① ② ③
- Other..... ① ② ③
- Undecided..... ① ② ③

Please be sure that only three circles have been marked in the above list.

23. Below is a general list of things that students sometimes do. Indicate which of these things you did during the past year in school. If you engaged in an activity frequently, Mark "f."

If you engaged in an activity one or more times, but not frequently, Mark "o"(occasionally). Mark "n"(not at all) if you have not performed the activity during the past year.

(Mark one for each item)

Frequently  
Occasionally  
Not at all

- Voted in a student election ..... (F) (O) (N)
- Came late to class ..... (F) (O) (N)
- Listened to New Orleans's (Dixieland) jazz ..... (F) (O) (N)
- Gambled with cards or dice ..... (F) (O) (N)
- Played a musical instrument ..... (F) (O) (N)
- Took a nap or rest during the day ..... (F) (O) (N)
- Drove a car ..... (F) (O) (N)
- Stayed up all night ..... (F) (O) (N)
- Studied in the library ..... (F) (O) (N)
- Attended a ballet performance ..... (F) (O) (N)
- Participated on the speech or debate team ..... (F) (O) (N)
- Acted in plays ..... (F) (O) (N)
- Sang in a choir or glee club ..... (F) (O) (N)
- Argued with other students ..... (F) (O) (N)
- Called a teacher by his or her first name ..... (F) (O) (N)
- Wrote an article for the school paper or literary magazine ..... (F) (O) (N)
- Had a blind date ..... (F) (O) (N)
- Wrote a short story or poem (not for a class) ..... (F) (O) (N)
- Played in a school band ..... (F) (O) (N)
- Played in a school orchestra ..... (F) (O) (N)
- Smoked cigarettes ..... (F) (O) (N)
- Attended Sunday school ..... (F) (O) (N)
- Checked out a book or journal from the school library ..... (F) (O) (N)
- Went to the movies ..... (F) (O) (N)
- Discussed how to make money with other students ..... (F) (O) (N)
- Said grace before meals ..... (F) (O) (N)
- Prayed (not including grace before meals) ..... (F) (O) (N)
- Listened to folk music ..... (F) (O) (N)
- Attended a public recital or concert ..... (F) (O) (N)
- Made wisecracks in class ..... (F) (O) (N)
- Arranged a date for another student ..... (F) (O) (N)
- Went to an over-night or week-end party ..... (F) (O) (N)
- Took weight-reducing or dietary formula ..... (F) (O) (N)
- Drank beer ..... (F) (O) (N)
- Overslept and missed a class or appointment ..... (F) (O) (N)
- Typed a homework assignment ..... (F) (O) (N)
- Participated in an informal group sing ..... (F) (O) (N)
- Drank wine ..... (F) (O) (N)
- Cribbed on an examination ..... (F) (O) (N)
- Turned in a paper or theme late ..... (F) (O) (N)
- Tried on clothes in a store without buying anything ..... (F) (O) (N)
- Asked questions in class ..... (F) (O) (N)
- Attended church ..... (F) (O) (N)
- Participated in organized demonstrations ..... (F) (O) (N)

24. Indicate the importance to you personally of each of the following: (Mark one for each item)

- Becoming accomplished in one of the performing arts (acting; dancing, etc.) ..... (E) (V) (S) (N)
- Becoming an authority on a special subject in my subject field ..... (E) (V) (S) (N)
- Obtaining recognition from my colleagues for contributions in my special field ..... (E) (V) (S) (N)
- Becoming an accomplished musician (performer or composer) ..... (E) (V) (S) (N)
- Becoming an expert in finance and commerce ..... (E) (V) (S) (N)
- Having administrative responsibility for the work of others ..... (E) (V) (S) (N)
- Being very well-off financially ..... (E) (V) (S) (N)
- Helping others who are in difficulty ..... (E) (V) (S) (N)
- Participating in an organization like the Peace Corps or Vista ..... (E) (V) (S) (N)
- Becoming an outstanding athlete ..... (E) (V) (S) (N)
- Becoming a community leader ..... (E) (V) (S) (N)
- Making a theoretical contribution to science ..... (E) (V) (S) (N)
- Writing original works (poems, novels, short stories, etc.) ..... (E) (V) (S) (N)
- Never being obligated to people ..... (E) (V) (S) (N)
- Creating artistic work (painting, sculpture, decorating, etc.) ..... (E) (V) (S) (N)
- Keeping up to date with political affairs ..... (E) (V) (S) (N)
- Being successful in a business of my own ..... (E) (V) (S) (N)

Essential  
Very Important  
Somewhat Important  
Not Important

25. Rate yourself on each of the following traits as you really think you are when compared with the average student of your own age. We want the most accurate estimate of how you see yourself. (Mark one for each item)

Trait	Highest 10 Percent	Above Average	Average	Below Average	Lowest Percent
Academic ability	<input type="radio"/>				
Athletic ability	<input type="radio"/>				
Artistic ability	<input type="radio"/>				
Cheerfulness	<input type="radio"/>				
Defensiveness	<input type="radio"/>				
Drive to achieve	<input type="radio"/>				
Leadership ability	<input type="radio"/>				
Mathematical ability	<input type="radio"/>				
Mechanical ability	<input type="radio"/>				
Originality	<input type="radio"/>				
Political conservatism	<input type="radio"/>				
Political liberalism	<input type="radio"/>				
Popularity	<input type="radio"/>				
Popularity with the opposite sex	<input type="radio"/>				
Public speaking ability	<input type="radio"/>				
Self-confidence (intellectual)	<input type="radio"/>				
Self-confidence (social)	<input type="radio"/>				
Sensitivity to criticism	<input type="radio"/>				
Stubbornness	<input type="radio"/>				
Understanding of others	<input type="radio"/>				
Writing ability	<input type="radio"/>				

26. How old will you be on December 31 of this year?

(Mark one)

- 16 or younger .....
- 17 .....
- 18 .....
- 19 .....
- 20 .....
- 21 .....
- Older than 21 .....

27. (If you are married, omit the following question)

What is your best guess as to the chances that you will marry

	While in College?	Within a Year after College?
Very good chance	<input type="radio"/>	<input type="radio"/>
Some chance	<input type="radio"/>	<input type="radio"/>
Very little chance	<input type="radio"/>	<input type="radio"/>
No chance	<input type="radio"/>	<input type="radio"/>

**Other Recent Publications by the Staff of the Office of Research  
American Council on Education**

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- Boruch, R. F., *A Procedure for Estimation of Trait, Method, and Error Variance Attributable To A Measure*, *Educational and Psychological Measurement*, Vol. 30, No. 3, Autumn, 1970. Pp. 547-574.
- Boruch, R. F., *Educational Research and the Confidentiality of Data*, ACE Research Reports, Vol. 4, No. 4, Washington: American Council on Education, 1969. 50 pp.
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- Drew, D. E., *A Profile of the Jewish Freshman*, ACE Research Reports, Vol. 5, No. 4. Washington: American Council on Education, 1970. 53 pp.
- Drew, D. E., *Undergraduates Planning a Career in Medicine*, Background paper for the Ninth Annual Conference on Research in Medical Education, Washington: The Association of American Medical Colleges, 1970. Pp. 215-220.
- Folger, J. K., Astin, H. S., and Bayer, A. E., *Human Resources and Higher Education*, New York: Russell Sage, 1970. 475 pp.
- Holtmann, A. G. and Bayer, A. E., *Determinants of Professional Income Among Recent Recipients of National Science Doctorates*, *Journal of Business*, 43 (October, 1970), 410-418.
- Schoenfeldt, L. F., Bayer, A. E., and Brown, M. D., *Delayed and Normal Progress College Students: A Comparison of Psycho-Social Characteristics and Career Plans*, *American Educational Research Journal*, March, 1970. Pp. 235-250.