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ABSTRACT

Entering freshmen in 13 fields of study were compared longitudinally on demographic characteristics, high school achievement, college selection process, ability to finance college, highest degree planned, academic expectations, career plans, and aspirations. Attributes of students in the humanities and nonhumanities were also assessed. The humanities fields were English, history, language and literature, philosophy, and "other humanities," while the nonhumanities fields were biology, business, education, engineering, physical science, health technology, social science, and "undecided." Data for 1967, 1972, 1975, and 1981 were obtained from the Cooperative Institutional Research Program, which provides national normative data on college students. Data on 37 variables were cross tabulated by major field of study with sex, race, and selectivity of institution. Six categories of institutions were used: two-year schools, public/private four-year black institutions, minimally selective four-year institutions, moderately selective four-year institutions, highly selective four-year institutions, and very highly selective four-year institutions. Statistical tables of study findings are appended. (SW)

Comparative Analysis of College Freshmen by Major Field of Study: A Changing Profile

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Precis

This study provides a longitudinal comparison of entering college freshmen by major field of study. The data-base utilized for this analysis was the Cooperative Institutional Research Program (CIRP) data upon which national norms for American freshmen have been established since 1966. This research contributes a unique frame of reference in that differences across fields of the study are highlighted with an emphasis on differences between humanities and nonhumanities. The divergent results obtained by major field indicate that the most substantive recommendations can be made for policy when a stratification scheme by field is employed.

Introduction

The Cooperative Institutional Research Program (CIRP) at UCLA and the American Council on Education have provided national normative data on college students for the past eighteen years. Every year, a nationally representative group of approximately 300,000 first-time, full-time college freshmen are surveyed with the Student Information Form (SIF). The survey measures demographic variables, background variables, academic variables, degree and career aspirations, and attitudinal variables. Although the survey is revised annually to reflect the changing concerns of the academic community, a core of thirty-seven variables has been consistently measured over the period of SIF implementation. SIF data are weighted by institutional type so that they are representative of the total relevant freshman population.

CIRP publishes an annual report, The American Freshman (Astin, et al., 1966 - 1982), summarizing SIF data by sex, type of institution, selectivity of institution, and geographic region. These data are used for the purposes of policy analysis, manpower planning, school counseling and administration, and educational research by a variety of audiences. In addition to providing normative data, the SIF data have been used as the bases of several major longitudinal research projects in higher education. Follow up data on CIRP college freshmen have been used to study college dropouts (Astin, 1975), campus protests (Astin, Astin, Bayer, & Bisconti, 1975), the relationship between education and work (Bisconte & Solmon, 1976) campus change (Astin, 1976), student development (Astin, 1977), and minorities (Astin, 1982).

While the CIRP data have been critically valuable in providing

descriptive information on the college population and allowing the identification of trends in freshmen characteristics, plans, attitudes and values; previous analyses of the data have not afforded an examination of responses by field of study. This study provides the first longitudinal analysis of college freshmen by major field of study. The objectives of the study were:

1) to compare students across thirteen fields of study over a fourteen year period on demographic characteristics, high school achievement (GPA), college selection process, ability to finance college, highest degree planned, academic expectations, career plans, and aspirations; and
2) to highlight attributes of students in the humanities in relation to students in eight other major fields of study.

The first objective responds to the need for disaggregated data analysis. Aggregation of the freshmen CIRP data masks important differences between sub-groupings that may have meaningful policy implications.

The second objective responds to the need of the funding agency, the National Endowment for the Humanities, for descriptive and comparative information on students in the humanities fields. Undergraduate enrollments in humanities fields have plummeted since 1970. With declining undergraduate enrollment, there has been a concomitant decline in academic positions in the humanities - one of the major professional slots for new humanities Ph.D.'s. The vitality, if not the survival of these disciplines, hence may be in jeopardy. It is of specific

concern to the Endowment whether or not students continuing in humanities today represent the brighter, more committed students who would most likely becoming leading scholars, or the students who have no options or potential for success in other fields. The results of this research address the concern that the best students are no longer enrolling in the humanities.

In sum, this study will describe differences in the freshmen data according to major field of study with a focus on differences between students in humanities and nonhumanities fields, and identify trends in the data within and across fields. Based on these analyses, policy implications in the areas of recruitment and financial reform will be suggested.

Method

Sample Selection

This research utilized the CIRP data base of American college freshmen described above. Four representative years of data were selected for this analysis: 1967, 1972, 1975 and 1981. From each of these data bases, a disproportionate stratified random sample of approximately 70,000 students was drawn. A sampling scheme was utilized whereby the entire sample of humanities students was retained with roughly equal subsamples selected from each of the other major fields (see Appendix A). This sampling plan allowed maximal use of the data available for humanities while keeping computer costs within the parameters of the budget.

The original CIRP sample was weighted and stratified by type of institution (two year college, four year college, university, and

predominantly black university), control of institution (public, private, Catholic, Protestant), and selectivity of institution (low, medium, high, very high). For the purpose of this analysis, the sample was further stratified as described above by thirteen major fields of study. Five of these were humanities: English, history, language and literature, philosophy, and other humanities. The eight nonhumanities fields were: biology, business, education, engineering, physical science, health technology, social sicence and "undecided".

Analysis

Data on thirty-seven SIF variables were cross tabulated by major field of study with sex, race (white, black, American Indian, Spanish, Asian, and other), and selectivity of institution. Six categories of institution were utilized: two year institutions, public/private four year Black institutions, minimally selective four year institutions, moderately selective four year institutions, highly selective four year institutions, and very highly selective four year institutions.

The crosstabulation procedure (Statistical Analysis System, 1982) yielded data martrices with fields of study labeling columns and levels of the SIF variable being examined labeling rows. In interpreting the data, only column percentages were used. That is, the percentage of students in a field responding to a given level of the variable under study was compared to the percentages of students in other fields responding to that level of the variable. Row percentages (which reflect the distribution of the sample across a level of a variable) were not used because the sample was stratified disproportionately. The latter type of comparison would only be valid for this sample and could not be

generalized to the larger population of college freshmen. Comparisons of column percentages, however, can validly be applied to populations of students in the fields being compared because samples were randomly selected from each field.

Because thirteen major fields of study were involved in all analyses, only the two highest and two lowest column percentages were reported for any variable. This procedure allowed the most important discriminations between fields to be made and reflected the range of response rates between fields. To facilitate interpretation, only responses to the highest level of scaled item variables were reported. Responses to all levels of categorical variables were reviewed.

Results

Demographics

Sex

The sample was almost equally divided by sex. Fifty-nine percent of the sample was female in 1967, 54% in 1972 and 1975, and 60% in 1981.[1] This is due primarily to the oversampling of humanities majors. More females were in humanities fields than were in other fields over the period of the study.

The field with the highest percentage of males was engineering across all years. The fields of history, philosophy and physical science were also predominated by males through out all years, although history and philosophy are generally not fields which lead to high paying jobs (except if they are viewed as prelaw curricula). Women seem to concentrate in fields traditional to them. Language and literature was the most predominantly female field in 1972, 1975, and 1981, followed by education (which had the highest percentage of females in 1967).

Table 1 lists the percent of females enrolled in each field from 1967 to 1981. The most rapid influx of females in a field occured in engineering where the percent of females grew from 2% in 1967 to 17% by 1981 (a dramatic 750% increase). There was also substantial movement of females into the fields of business, biology, and social sciences.

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1 Because this sample was disproportionate, the demographics described in this section are only relevant to this sample; they are not intended to reflect the population of college freshmen as a whole. The purpose of presenting them at this level of detail is to afford a thorough description of this sample.

Business and biology, which were predominantly male in 1967, were equally divided by sex in 1981. There was also a gradual but steady increase in the percentage of females who were "undecided" about their field choice. Females tended to de-emphasize the field of health technology over the years, although this field was still nearly 75% female in 1981. The percentage of females in the humanities remained relatively stable over the years.

Race

The sample was broken down into the following racial categories: white, black, Asian, American Indian (1967 only), Spanish (1972, 1975, and 1981 only), and other races.

The majority of students in the sample were white (approximately 88%) across all years (see Table 2). Black students represented 4% of the sample in 1967, 6% in 1972, and 7% in 1975 and 1981. Although these percentages appear at first to be disproportionately low, in fact they reflect increasing portions of the black population ages eighteen to twenty-one years. In 1967, 11% of the US population in this age range was black (US Bureau of Census, 1967); 4% of the college freshmen in the 1967 sample were black. By 1975, the percentage of black students in the sample had risen to 7%, while the percentage of blacks in the college age population had only risen to 13% (US Bureau of Census, 1975). The share of black students in college rose from approximately one third to one half. This share was maintained in 1981.

Asian, Spanish and American Indian students represented approximately 1% of the sample each across all years. Other races accounted for approximately 3% of the sample throughout all the years. Except for the

increase in the percentage of blacks from 1967 to 1972, the racial distribution was constant across the period of the study.

The racial composition of fields across the years was not consistent however (see Table 3). Although different from year to year, the fields having the highest percentage of white students were all humanities (with the exception of 1972 which was "undecided"). The fields having the highest percentage of black students were primarily service oriented. The shift of blacks out of social science and education into business in 1981 is an encouraging change away from what has been traditional for them, towards a field which might yield higher paying jobs. The fields having the highest percentage of Asian students were science oriented. There appeared to be a trend beginning in 1975 toward social science as the field with the highest percentage of Spanish students.

Across all the years, the mean percentage of students in humanities fields who were white was higher than the mean percentage of students in other fields who were white. The mean percentage of students in humanities fields who were black, Asian, Spanish and American Indian was almost always lower than the mean percentage of students in other fields of these same races.

Sex by Race

The male and female distributions by race were nearly identical. In other words, the proportions of females who were white, black, American Indian, Spanish, Asian, or of other races were the same as the corresponding proportions of males.

When fields were analyzed by race and sex, there were some sex differences within races. From 1972 to 1981, the field with the highest percentage of black males was education. The fields with the highest percentages of black females were business and, most recently, engineering. Thus, the greater presence of blacks in business is reflecting the increase in black female college attendance. The field with the highest percentage of Asian males across all the years was health technology. For three years, the field with the highest percentage of Asian females was engineering. Fields with high percentages of Spanish students were similar for males and females from 1972 to 1975 (language and literature and social science), but in 1981 the field with the highest percentage of Spanish females was engineering (note similarity between black, Asian and Spanish females). Education had the highest percentage of Spanish males in 1981. Sex differences were least apparent for white students. Except for 1972, the fields with the highest percentages of white males were humanities, and for all of the four years the fields with the highest percentages of white females were humanities.

Selectivity of Institution

As described above under method, institutions of higher education were categorized by six levels of selectivity: two year institutions, minimally selective four year institutions, moderately selective four year institutions, highly selective four year institutions, very highly selective four year institutions, and public/private four year black institutions.

Throughout the period of the study, the majority of students attended minimally, moderately, or highly selective institutions (see Table 4). Eighty-two percent of students in the 1967 sample were almost evenly divided among these three levels of selectivity as were 79% of students in the 1972 sample and 80% of students in the 1981 sample. The distribution of students among these three levels of selectivity varied in 1975 however. Sixty-six percent of students attended minimally selective institutions and 23% attended moderately selective institutions with very few students at highly selective institutions.[2] Of course, by their nature, the more selective institutions would accept fewer, and more able, students. The percentage of students attending two year institutions was highest in 1972 with a declining trend noted from the early years of the study to the later years. This might be due to the nature of the sample: we over sampled humanities fields which are not high priorities of many two year colleges. Slightly more students attended very highly selective institutions in 1981 than in early years. The percentage of students at public/private black institutions was relatively low and constant over the period of the study.

In general, the fields with the highest percentage of students enrolled in two year institutions, minimally and moderately selective institutions, and public/private black institutions were business, education and health technology (see Table 5). This was consistent across the years of the study. The fields with the highest percentage of

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2 It should be noted that in 1975 data for very highly selective and public/private black institutions were not available.

students enrolled in highly and very highly selective institutions were philosophy and physical science.

The fields having the highest percentage of students in various types of institutions changed over the years. Fields with the highest percentages of students in two year institutions and public/private black institutions changed most frequently from year to year varying between social science, education, and business (in 1981). Education had a high percentage of students in minimally selective institutions for two of the four years, and a high percentage of students in moderately selective institutions for three of the four years. Many highly selective colleges and universities do not offer education as an undergraduate major. Fields with the highest percentage of students enrolled in highly selective institutions alternated between science and the humanities. Very highly selective institutions changed the least. Except for 1975, the field of philosophy had the highest percentage of students enrolled in institutions at this level of selectivity.

In 1967, students in humanities fields tended to enroll more often in moderately, highly, and very highly selective institutions than students in other fields. However, in 1972 the trend reversed. More humanities students were enrolled in two year institutions, minimally and moderately selective institutions, and public/private four year black institutuions. In 1975 students in humanities fields began enrolling more frequently in more selective institutions, and by 1981, a higher percentage of students in humanities fields were enrolled in highly and very highly selective institutions than were students in other fields.

Sex by Selectivity of Institution

Table 6 illustrates the distribution of students by selectivity of institution and sex. The enrollment trends discussed above for selectivity of institution are apparent for both males and females. However, there were some differences within institutional types by sex. More males were enrolled in two year institutions and in highly selective institutions (except for 1975 when more females were enrolled in highly selective institutions). More females were enrolled in minimally and moderately selective institutions (except for 1975 when more males were enrolled in minimally selective institutions). There were no sex differences in enrollment for very highly selective institutions or for public/private black institutions.

When fields were analyzed by institution and sex, some differences attributable to sex were apparent within institutional types. The field having the highest percentage of males in two year institutions was education (the high percentage of males in education represented a recent shift from health technology), while the field with the highest percentage of females was business. Education was also the field having the highest percentage of males in public/private black institutions, whereas business and social science had the highest percentage of females in this type of institution. This pattern was reversed for the moderately selective institutions. Education had the highest percentage of females in these institutions while the highest percentage of males varied from field to field over the years (with business having the highest percentage in 1981). There were no differences by sex in fields

of study for very highly selective institutions (philosophy had the highest percentages of both males and females in these institutions); highly selective institutions (physical science and humanities fields had the highest percentages of both males and females); or for minimally selective institutions (health technology and education had the highest percentages of both sexes).

Race by Selectivity of Institution

Table 7 shows the breakdown of the sample by selectivity of institution and by race.[3] The distribution of white students most closely reflects the overall distribution by selectivity of institution depicted in Table 4 because they comprise approximately 88% of the sample. There is a considerable degree of variance however, in the distributions of other races across levels of selectivity. American Indians, Spanish, and Asian students were overrepresented in two year institutions. Black students obviously predominated in public/private black institutions. American Indian students were overrepresented in minimally selective institutions; while black, Asian, and Spanish students were underrepresented. Compared to white students, all other students were underrepresented in moderately selective institutions. Asian students were overrepresented in highly and very highly selective institutions, while black and American Indian students were underrepresented.

3 The data for 1975 did not included public/private black institutions or very highly selective institutions. The 1975 relative percentages of students by level of selectivity are therefore not comparable to the 1967 and 1972 distributions. No data were available for 1981.

GPA

Table 8 presents data on the high school GPA of students across fields.[4] The fields with the highest GPA's across all the years of the study were physical science and language and literature. Business had the lowest or one of the lowest GPA's for all four years. Education had very low GPA's from 1972 to 1981.

Overall, grades increased by 8% between 1967 and 1981 (from 3.04 to 3.27). This may reflect the much publicized grade inflation trend nationwide. Except for history (10%), increases in the GPA of students entering the humanities fields were below average. The most dramatic increases were in business (14%), followed by engineering and health technology at 11% each. This implies that better students are selecting undergraduate programs in business more than in the past.

When comparing humanities fields to nonhumanities fields, students in humanities fields had higher GPA's for every year (see Table 9).[5]

GPA by Sex

GPA's for males and females appear in Table 10. As can be seen from the table, GPA's for females were always higher than GPA's for males. However, males seem to have benefited from grade inflation more than females, as the gap between the sexes has narrowed.

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4 Because overall data were not available in 1975, GPA means for that year were weighted means using data available for GPA by sex in 1975.

5 Means for humanities and nonhumanities in 1975 were based on weighted means using data available for GPA by sex in 1975.

When GPA was analyzed by sex and field of study, certain trends emerged. Females in physical science and engineering consistently had the highest GPA's. Only in 1981 did males in physical science have one of the very highest GPA's. Males in business and education consistently had the lowest GPA's.

GPA by Race

Table 11 shows the distribution of GPA by race. Asian students had the highest GPA's followed by white students, American Indians or Spanish students and black students. This ordering was consistent across all years.

When GPA was analyzed by race and field of study, trends emerged for the highest and lowest GPA. The highest GPA's were held by Asian students in the sciences across all the years. In 1967, American Indians had the lowest GPA (they were "undecided" and in the fields of engineering). But from 1972 on, blacks (in various fields) almost always had the lowest GPA (in 1972, Asian students in history had the lowest GPA).

GPA by Selectivity of Institution

Table 12 shows the distribution of GPA by selectivity of institution. The highest GPA's were always in highly selective and very highly selective institutions as expected. The lowest GPA's were in two year institutions and public/private black institutions. These trends were consistent from 1967 to 1981.

When GPA was examined by selectivity of institution and field of study, it is apparent that students in the field of physical science enrolled in very highly selective institutions had the highest GPA's overall (in 1972, the fields of health technology and philosophy at very highly selective institutions captured students with the highest GPA's).[6] The lowest GPA's alternated between "undecided" students in two year institutions and students in the fields of humanities and education enrolled in public/private black institutions.

College Selection and Finance

Influence of Others in College Choice

Four variables examined the extent to which students were influenced by others in choice of college: relatives' influence, friends' influence, teachers' influence, and recruiters' influence. The data were summarized by comparing fields with relatively high percentages of students responding "very important" to the fields with relatively low percentages of students responding in that manner. The data for these variables are summarized in Table 13.

Data for relatives' influence and friends' influence were similar. The field with the highest percentage of students responding "very important" to both variables was education. Relatively high percentages of students in the field of business and students who were "undecided" were

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6 In 1975, data for very selective institutions were not available, but students in the fields of physical science at highly and moderately selective institutions had the highest GPA's consistent with the overall trend.

also influenced by relatives and friends. The lowest percentage of students influenced by relatives and friends were in the fields of philosophy and engineering. There do not appear to be any trends over time in response to these variables. Students in the fields of education and other humanities were relatively more influenced by teachers than were students in other fields, but there were no clear trends for teachers' influence. However, a reoccurring field with the lowest percentage of students influenced by teachers was the same as that for relatives' and friends' influence -- philosophy.

There were no clear patterns for recruiters' influence by field. In the more recent years, education had the higest percentage of students reporting this influence. As student demand for teacher training has declined, colleges have felt the need to attract students by active recruiting. It is interesting to note that history had a relatively high percentage of students reporting recruiters' influence in 1975.[7] As for the other modalities of influence, the field of engineering reported very low percentages of students influenced by recruiters. Here the demand was so high, there was no need to recruit. The field of language and literature also reported a relatively low percentage of students influenced by recruiters.

Overall, responses to influence of others were strongest in 1967 and show a declining trend through 1981.

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7 One would expect that the declining market demand for humanities graduates would have limited the recruitment of students into fields such as history by 1975.

Students in the humanities fields were generally less influenced by others than were students in other fields.

Ability fo Finance College

Students' ability to finance college was examined by comparing fields with relatively high percentages of students reporting this to be a "major concern" to fields with relatively low percentages of students reporting this as a "major concern" (see Table 14). Prior to 1975, there were no trends in fields reporting college finance as a "major concern". However, in 1975 and 1981, the fields of health technology and other humanities had the highest percentage of students reporting this as a "major concern". Fields with relatively low percentages of students reporting finance as a "major concern" were history and business. An interesting finding was the shift in the field of philosophy from 1967, when a relatively high percentage of students reported college fianance as a "major concern", to 1981 when a relatively low percentage of students responded in this manner.

Overall, there was an increase in the percentage of students reporting college finance as a "major concern" since 1967. The rate of concern seems to have leveled off since 1975, however.

In the earlier years of the study, a higher percentage of students in humanities fields reported college finance as a "major concern" than did students in nonhumanities. However, since 1975, some types of humanities students have been less concerned with financing college than students in the other fields.

Two things are strikfng about these data. First, throughout the period studied, no field revealed more than 20% of its students having a major concern with their ability to finance college. Apparently, various federal and state need-based financial aid programs were generally achieving their purposes. Second, the fields where concern was greatest seem to be those fields with relatively weak earnings prospects, or at least fields where graduate/professional study would be required before high paying jobs could be obtained. Thus, the concern being expressed by humanities, social science, and education majors may be reflecting doubt about how much debt students can take on, given the perceived difficulty in repaying such debt out of low salaries. Or it might be reflecting the view that undergraduate education will not be the end of schooling and the need to pay for it. Finally, it may be that students with less financial resources are entering these fields.

Academic Expectations

Highest Degree Planned

Because the sample was disproportionate by field of study, the overall sample distribution of students by highest degree planned would reflect only this sample's characteristics and not the population of college freshmen as a whole. For this reason, a discussion of the sample distribution would be of limited use and possibly be misleading. Instead, a discussion of differences in selection of highest degree by field of study will be pursued which can be generalized to a larger population.

Very consistent data were obtained when highest degree planned was analyzed by major field of study. These data appear in Table 15. The only students who consistently planned the Bachelor's degree were those in business. There was a marked emphasis on graduate degrees in 1975 and 1981. Students in the field of health technology began planning the M.D. degree rather than the Bachelor's degree in 1981. Students in education and engineering reset their degree goals at the Master's level in 1975. Biology students shifted from the Master's to the M.D. in 1975. Students studying history switched from the Master's to the LL.B. or the J.D. degree in 1975. Even students who were "undecided" about their field of study seemed to think the Master's was necessary for whatever field they might choose. Students in the fields of English, language and literature, and the social sciences have consistently planned the Masters degree, while students in the field of philosophy have been the most motivated to attain the Ph.D. or Ed.D. degree.

A notable deviation from this pattern toward more advanced degrees is the recent shift of students in the physical sciences away from the Ph.D. back to the Master's degree. These data lend support to predictions by some economists that there is likely to be a serious shortage of scientists in the future (Solmon, Kent, Ochsner, & Hurwicz, 1981). Financial incentives to promote advanced study in the physical sciences would be one way to curtail a manpower shortage that could have serious ramifications for scientific and technical areas.

Table 16 presents comparative data on highest degree planned for humanities and nonhumanities fields. It is apparent that across all

graduate degrees (except the M.D.), a higher percentage of humanities students planned these degrees. The increased demand for the Master's and the Ph.D. degrees in recent years may reflect a realization on the part of humanities students that more advanced degrees are necessary in order to successfully compete for fewer humanities jobs.

Expectations of Academic Achievement

Three variables measured students' expectations of academic achievement: **fail one or more classes, be elected to an honor society, and graduate with honors.** Data were summarized by comparing fields with relatively high percentages of students responding "very good chance" to those with relatively low percentages of students responding in this way. The data for these variables appear in Table 17.

The expectation to fail one or more classes might be interpreted as a reflection of students' academic self-concept. The field with the highest percentage of students with this fear across all years of the study was philosophy. This was a surprising finding in light of the relatively high GPA of this field (see Table 8). The group of "undecided" students also had a relatively high percentage of students having fears of failing one or more classes. The one field consistently without this fear of failure was language and literature.

The variables be elected to an honor society and graduate with honors seemed to tap into the same construct -- academic self confidence. The fields of physical science and philosophy consistently had high percentages of students believing they had a "very good chance" of achieving these goals. The high percentage of physical science students

was not unexpected (the field had a relatively low percentage of students expecting to fail one or more classes), but the high percentage of philosophy students seems contradictory given the results of the previous analysis of expected failure. It could be that these students were particularly conscious of all academic outcomes and may have had a heightened fear of failure despite their experience of academic success. Students in the field of education and students who were "undecided" were least likely to expect high levels of academic achievement. Overall, students' expectations of academic achievement were far more optimistic in the later years of the study than they were in 1967.

High percentages of students in humanities fields expected to fail one or more classes throughout the period of the study. At the same time, higher percentages of humanities students expected to be elected to an honor society and graduate with honors than did nonhumanities students. The rationale described for the field of philosophy -- that these students may have been both more anxious and more directed toward high academic goals -- may explain this apparent contradiction. Or it might be that ability level of philosophy students is bimodal; very good and very bad students enter this field.

Career Plans

Choice of Career

The overall distribution of students by choice of career will not be presented due to the disproportionate sample employed. Instead, a discussion of differences in choice of career by field of study will follow which can be applied to a larger population.

Table 18 presents the most frequently chosen careers by field from 1967 to 1981. Most career choices were predictable given students' major field of study. Several fields indicated the same career focus from year to year with little fluctuation in rate of response (philosophy: "undecided"; physical science: researcher; "undecided": "undecided").

Other careers increased in popularity within fields. The percentage of business students who indicated "businessperson" as a probable career increased steadily since 1967. This probably indicates a shift of undergraduate business curricula away from training for office work toward training for management. It also reflects the high ability of more recent business students. More engineering students chose engineering as a career in 1981 than they had in earlier years. This increase may reflect a change in the population of engineering students that recently includes more nontraditional students. The percentage of students studying other humanities who chose artist as a probable career increased since 1972. This may be due to the fact that in a tightening job market, students with backgrounds in other humanities have less access to careers outside their area and thus must focus on careers relevant to their training.

In 1975, the declining market for school personnel was evident in the shift of three humanities fields (English, history, and language and literature) away from school personnel. By 1981, education students also began to look outside of school personnel for probable careers. English and language and literature students planned to capitalize on pratical applications of humanities subject matter in their career choice as an

alternative to school personnel. As a whole however, humanities students were least certain about their career plans. Changes were also evident in the health related fields. Biology students switched from research careers to the medical profession in 1975. This change may reflect more or better job opportunities available in the latter career. Students in health technology changed their career plans from the health profession to the medical profession in 1981. This shift toward a higher level of professionalism reflects the more recent role of health technology as a pre-med field rather than as a training ground for paraprofessionals.

Careers which were indicated more often by students in the humanities than by students in other fields were: architect (1972 - 1981), clergyman (all years), college teacher (all years), artist (all years), and writer (all years).

Change in Career Plans

Table 19 presents data for the variables change career choice and change major field of study. Predictably, the "undecided" group had the highest percentage of students who indicated a "very good chance" that they would change their career choice. The field of philosophy was a close second which concurred with the finding that philosophy had a relatively high percentage of students who had not decided on a career (see Table 18). These were the most uncertain groups across all the years. The fields with the lowest percentage of students expecting to change their career choice were engineering and health technology. Students in these fields appeared to become even more certain of their

career choices (and their choice of field) in recent years. These differences reflect the more and less vocational nature of various fields. The optimist could say that the humanities prepare students for a wide variety of careers, but the pessimist might respond that training in the humanities is perparation for very little.

Fields with the highest percentages of students indicating a "very good chance" of changing their major field of study were two humanites fields -- philosophy and English; the fields with the lowest percentage were, again, engineering and health technology. There was almost no change in this pattern over the period of the study.

A higher percentage of students in the humanities fields reported "a very good chance" of both changing career choice and changing major field of study than did students in nonhumanities fields. This trend was consistent across all years.

Aspirations

Variables relating to student aspirations can be classified as those pertaining to productivity: contribution to science, writing original works, creating artistic works, and becoming accomplished in performing arts; those relating to success: being well off financially, success in own business, and recognition from colleagues; and those implying general/altruistic values: helping others in difficulty, developing a philosophy of life, and keeping up to date with politics. Data for these variables were summarized by comparing the fields with relatively high percentages of students responding "very important" to those with

relatively low percentages of students responding "very important".[8]

Productivity Related Aspirations

As can be seen from Table 20, responses to variables relating to productivity were highly consistent over time. Not only were the fields homogeneous within variables (the same fields had the highest or lowest percentage of students responding "very important"), but the rates of responses were nearly the same from year to year. The fields with the highest percentage of students rating **contribution to science** as "very important" were biology and physical science; as expected, the fields with the lowest percentage of students rating the variable as "very important" were language and literature and English. Humanities fields had the highest percentages of students rating **writing original works, creating artistic works, and becoming accomplished in performing arts** as "very important". English and philosophy had the highest percentage of students rating **writing original works** as "very important", while other humanities and philosophy had the highest percentage of students rating **creating artistic works and becoming accomplished in performing arts** as "very important". Across all years, business and engineering had the lowest percentage of students rating these three variables as "very important".

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8 The responses for this variable included "not important", "somewhat important", "very important", and "essential". In order to achieve an equidistant scale, the data were trichotomized by combining "essential" with "very important".

Humanities fields had higher percentages of students rating writing original works, creating artistic works, and becoming accomplished in performing arts as "very important" than did nonhumanities fields. Nonhumanities fields had higher percentages of students rating contribution to science as "very important". These patterns were consistent over all years.

Success Related Aspirations

Table 21 presents data for variables relating to success. Fields having high percentages of students rating indicators of success as "very important" were different from those predominant in the analysis of the productivity variable above. Business and engineering had the highest percentages of students rating being well of financially as "very important" while philosophy and English had the lowest. In 1972, there was a drop in the perceived importance of this variable, but it has been increasing rapidly in importance since.

Business and engineering were also the fields having the highest percentage of students rating success in own business as "very important". Students in the fields of philosphy and language and literature were least likely to rate this variable as "very important". Although the importance of this variable seemed to decline in 1972, the trend since then has been one of increasing importance.

Fields with the highest percentage of students rating recognition from colleagues as "very important" were other humanities and engineering. This variable also demonstrated a considerable jump in perceived importance from 1975 to 1981.

Humanities fields had consistently lower percentages of students rating success variables as "very important" than did nonhumanities fields.

Values Related Aspirations

Variables implying general/altruistic values are summarized in Table 22. The fields of health technology and social science had the highest percentage of students rating helping others in difficulty as "very important". The fields with the lowest percentage of students rating this variable as "very important" were engineering and physical science. There was no change in responses to this variable over the years.

As would be expected, the humanities fields of philosphy and English had very high percentages of students rating developing a philosophy of life as "very important". Business and education had relatively low percentages of students rating a philosophy of life as "very important". There was a marked decreasing trend in perceived importance of this variable over the period of the study.

The fields of history and social science consistently had the highest percentage of students rating keeping up to date with politics as "very important", students in the fields of health technology and education were least likely to rate this variable as "very important".

Humanities fields had higher percentages of students rating helping others in difficulty, developing a philosophy of life, and keeping up to date with politics as "very important" than did nonhumanities fields.

Alexander Astin has pointed out that over the period of the CIRP, students seem to have become more interested in money-related outcomes of their education. He attributes this to an overall decline in altruism in

the population. Our findings confirm the trends revealed by Astin. Several explanations are possible. One is that, as the job market has shifted toward demand for business and engineering careers, more students enroll in these fields and are converted into more materialistic people. Another is that as humanities graduates are having more difficulty finding jobs, prospective humanities students eschew these fields and thus enter fields which inculcate the earnings motivation in them. Perhaps a more plausible explanation is that college students always were concerned with money, but only began to express this concern when they perceived that college did not insure success in their chosen careers. As long as college guaranteed good jobs for all graduates, none needed to be concerned. But the current riskiness of the job market has necessitated a more money/success oriented outlook on the part of students.

Conclusions

This study represents a path-breaking effort to cull out differences among college freshmen who select various fields of study. Using simple crosstabulations to disaggregate CIRP data collected over a fourteen year period, profiles of fields were drawn. Some of the patterns found within fields were consistent over time, while others were dynamic reflecting the changing needs of students and demands of the job market. The interpretations we have generated should be considered the first level of analysis; more comprehensive multivariate analyses are needed to follow-up specific aspects of the data. Some findings that emerged as clear trends in the data are the following.

Females are gravitating toward fields traditionally reserved for

men. The fields of engineering, business, and biology are becoming increasingly populated by females. More blacks that are college age are going to college than ever before. Black students, particularly females, are breaking away from service oriented fields towards fields with more earnings potential.

Trends were apparent in the quality of students by field. We find that most humanities fields, except history, have seen their students' grades rise more slowly than other fields. In particular, some top students who formerly selected humanities are likely to be majoring in business now. The concern with maintaining quality in the humanities should not be taken lightly. Despite statements from those now in the humanities that business/money issues are not a concern, one cause of the decline in both numbers and relative quality of humanities freshmen clearly might be that students formerly interested in humanities during a good job market are no longer interested.

An encouraging finding is that financial aid programs seem to be working. Relatively small percentages of students were very concerned about financing their college education. Students in fields where job prospects are worse have the most concern. Hence, if we want to maintain a flow of top students into fields like humanities and particularly education, those might be areas for expanded financial aid.

Perhaps the most striking finding from the total analysis of change is how little change has taken place within fields. Those who major in humanities or in business today are quite similar to their predecessors of fourteen years earlier. Aggregate data which shows that students have changed reflect changes in choice of major (see Table 23). The rapid

growth in business and engineering, to the detriment of mainly humanities and education, reflects changing values of entering freshmen. Student changes are likely to reflect the different environment being faced by today's graduates. Ever since the beginning of CIRP, access to college has greatly expanded. Merely going to college does not insure career success because a wider range of students enter and graduate. What is important today is quality of college, major, and grades. Students seem to be reflecting this more and more over the years.

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Table 1
Percent of Females by Field of Study

Year	Other Humanities %	English %	History %	Language and Literature %	Philosophy %	Biology %	Business %
1967	66%	74%	44%	87%	36%	39%	30%
1972	55	69	39	85	34	38	—
1975	61	65	38	87	35	44	34
1981	65	68	41	84	37	53	52
Change	-1%	-6%	-3%	-3%	+1%	+14%	+22%

Table 1 (Continued)
Percent of Females by Field of Study

Year	Education %	Engineering %	Physical Science %	Health Technology %	Social Science %	Undecided %
1967	88%	2%	33%	86%	50%	45%
1972	76	3	33	84	58	51
1975	78	10	31	78	59	57
1981	83	17	38	73	65	64
Change	-5%	+15%	+5%	-13%	+15%	+19%

Table 2

Distribution of Sample by Race

Year	White	Black	Asian	American Indian	Spanish	Other
1967	89%	4%	1%	5%	__%	3%
1972	89	6	1	__	1	2
1975	87	7	1	__	1	3
1981	88	7	2	__	1	3

Table 3
Fields with the Highest Percentages of Students by Race

Year	White	%	Black	%	American Indian	%	Spanish	%	Asian	%
1967	Philosophy	92%	Social Science	7%	Education	.86%	___	%	Engineering	2%
	English	92	Health Technology	6	Business	.79	___		Biology	2
1972	"Undecided"	91	Social Science	12			Language and Literature	3	Engineering	2
	Biology	91	Education	10			Health Technology	2	Physical Science	2
1975	Language and Literature	91	Education	13			Social Science	2	Engineering	3
	English	90	Social Science	12			Language and Literature	2	Biology	3
1981	History	93	Health Technology	10			Social Science	2	Biology	4
	English	92	Business	10			Engineering	2	Engineering	4

Table 4

Distribution of Sample by Selectivity of Institution

Year	Two year institutions	Public/private four year black institutions	Minimally selective four year institutions	Moderately selective four year institutions	Highly selective four year institutions	Very highly selective four year institutions
1967	10%	2%	30%	23%	29%	5%
1972	12	3	28	23	28	6
1975	5	—	66	23	7	—
1981	7	3	21	27	32	9

Table 5

Fields with the Highest Percentages of Students by Selectivity of Institution

Year	Two year Institutions	%	Public/private four year black institutions	%	Minimally selective four year institutions	%	Moderately selective four year institutions	%	Highly selective four year institutions	%	Very highly selective four year institutions	%
1967	Business	25%	Social Science	4%	Health Technology	41%	Education	27%	Philosophy	42%	Philosophy	16%
	Health Technology	18	History	4	Education	41	Language and Literature	27	Physical Science	41	English	8
1972	Health Technology	22	Education	6	Education	39	Education	25	Physical Science	42	Philosophy	16
	Engineering	15	Social Science	6	Health Technology	37	Language and Literature	24	Engineering	39	Language and Literature	12
1975	Education	10	—		Philosophy	72	English	24	History	8	—	
	Business	9	—		Biology	69	History	24	Education	8	—	
1981	Business	14	Business	5	Education	34	Education	32	Physical Science	44	Philosophy	29
	Education	12	Social Science	4	Other Humanities	26	Other Humanities	32	Engineering	42	Language and Literature	22

Table 6

Distribution of Sample by Sex and Selectivity of Institution

Year		Two year institutions	Public/private four year black institutions	Minimally selective four year institutions	Moderately selective four year institutions	Highly selective four year institutions	Very highly selective four year institutions
1967	Male	12%	2%	30%	21%	29%	6%
	Female	9	3	31	24	28	4
1972	Male	13	3	27	22	30	6
	Female	10	4	30	25	27	6
1975	Male	6	—	68	21	5	—
	Female	5	—	63	24	8	—
1981	Male	8	3	21	26	34	9
	Female	7	3	22	28	31	9

Table 7

Distribution of Sample by Race and Selectivity of Institution[a]

Year		Two year institutions	Public/private four year black institutions	Minimally selective four year institutions	Moderately selective four year institutions	Highly selective four year institutions	Very Highly selective four year institutions
1967	White	10%	.3%	31%	24%	29%	6%
	Black	13	50	20	7	8	2
	American Indian	21	2	54	11	11	1
	Asian	23	.2	13	14	43	7
1972	White	11	.1	29	25	29	6
	Black	11	47	17	9	14	3
	Spanish	36	.5	20	16	23	5
	Asian	23	.1	13	13	41	10
1975	White	5	—	66	23	7	—
	Black	9	—	58	25	9	—
	Spanish	9	—	64	20	7	—
	Asian	2	—	67	22	9	—

a) Data for 1981 were not available by race and selectivity of institution.

Table 8

High School GPA by Field

Year	Other Humanities $\bar{X}$	English $\bar{X}$	History $\bar{X}$	Language and Literature $\bar{X}$	Philosophy $\bar{X}$	Biology $\bar{X}$	Business $\bar{X}$
1967	2.97	3.16	2.94	3.29	3.13	3.11	2.71
1972	3.06	3.21	3.04	3.37	3.14	3.20	2.89
1975	3.11	3.33	3.24	3.40	3.28	3.38	3.03
1981	3.06	3.38	3.26	3.44	3.30	3.39	3.09
Change	1.03	1.06	1.10	1.04	1.05	1.09	1.14

Table 8 (continued)

High School GPA by Field

Year	Education	Engineering	Physical Science	Health Technology	Social Science	"Undedcided"	Overall
	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
1967	2.96	3.00	3.28	3.00	3.00	2.94	3.04
1972	2.98	3.12	3.39	3.08	3.10	3.09	3.13
1975	2.94	3.45	3.49	3.19	3.20	3.16	3.25
1981	3.06	3.34	3.45	3.33	3.24	3.23	3.27
change	1.03	1.11	1.05	1.11	1.08	1.09	1.07

Table 9

High School GPA of Humanities and Nonhumanities Students

Year	Humanities $\bar{X}$	Nonhumanities $\bar{X}$
1967	3.10	3.00
1972	3.16	3.11
1975	3.27[a]	3.23
1981	3.29	3.27

a) Data for 1975 were based on weighted means of GPA by sex in 1975.

Table 10

High School GPA by Sex

Year	Male $\bar{X}$	Female $\bar{X}$
1967	2.90	3.16
1972	2.79	3.24
1975	3.15	3.33
1981	3.22	3.34

Table 11

High School GPA by Race

Year	White	Black	American Indian	Spanish	Asian
	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
1967	3.05	2.78	2.80	—	3.16
1972	3.15	2.83	—	3.00	3.24
1975	3.27	2.94	—	3.19	3.32
1981	3.31	2.94	—	3.25	3.48

Table 12

High School GPA by Selectivity of Institution

Year	Two year institutions $\bar{X}$	Public/private four year black institutions $\bar{X}$	Minimally selective four year institutions $\bar{X}$	Moderately selective four year institutions $\bar{X}$	Highly selective four year institutions $\bar{X}$	Very highly selective four year institutions $\bar{X}$
1967	2.63	2.74	2.90	2.84	3.27	3.38
1972	2.77	2.79	3.02	3.13	3.34	3.44
1975	2.89	—	3.25	3.25	3.25	—
1981	2.89	2.80	3.14	3.23	3.42	3.55

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Table 13

Fields with the Highest and Lowest Percentages of Students Rating Influence of Others on College Choice as Very Important

	Highest		Lowest	
Year	Field	%	Field	%
		Relatives' Influence		
1967	Education	50%	Philosophy	32%
	History	49	Physical Science	40
1972	Education	11	Philosophy	6
	History	10	Engineering	7
1975	Education	8	Philosophy	5
	"Undecided"	8	Engineering	5
1981	Education	8	Engineering	5
	"Undecided"	7	Philosophy	5
		Friends' Influence		
1967	Education	20	Philosophy	12
	Business	17	Engineering	12
1972	Business	5	Philosophy	2
	"Undecided"	4	Biology	2
1975	Education	9	Engineering	4
	Other Humanities	8	Physical Science	5
1981	Education	7	Engineering	4
	Business	7	Language and Literature	4

Table 13 (continued)

Fields with the Highest and Lowest Percentages of Students Rating Influence of Others on College Choice as Very Important

	Highest		Lowest	
Year	Field	%	Field	%
	Teachers' Influence			
1967	English	22%	"Undecided"	16%
	Other Humanities	22	Philosophy	18
1972[a]				
1975	Education	8	Philosophy	5
	"Undecided"	8	Engineering	5
1981	Other Humanities	7	Physical Science	3
	Education	5	"Undecided"	3
	Recruiters' Influence			
1967	Other Humanities	14	"Undecided"	10
	Social Science	14	Engineering	11
1972	Health Technology	7	Philosophy	5
	Engineering	6	Physical Science	5
1975	Education	6	Language and Literature	3
	History	4	Engineering	3
1981	Education	7	Engineering	3
	Business	5	Language and Literature	4

a) Data for 1972 were not available.

Table 14

Fields with the Highest and Lowest Percentages of Students Having Major Concern Over Ability to Finance College

	Highest		Lowest	
Year	Field	%	Field	%
1967	Philosophy	10%	Biology	7%
	Other Humanities	10	Business	7
1972	Social Science	16	Engineering	11
	Education	16	"Undecided"	13
1975	Health Technology	20	History	14
	Other Humanities	19	Business	14
1981	Other Humanities	20	History	12
	Health Technology	19	Business	14

Table 15
Most Frequently Planned Degree by Field

Year	Other Humanities		English		History		Language and Literature		Philosophy		Biology		Business	
	Degree	%	Degree	%	Degree	%	Degree	%	Degree	%	Degree	%	Degree	%
1967	BA	43%	MA	45%	MA	41%	MA	45%	PhD	40%	MA	33%	BA	46%
1972	MA	34	MA	34	MA	30	MA	39	PhD	29	MA	26	BA	41
1975	MA	32	MA	31	LLB/JD	31	MA	36	PhD	29	MD	45	BA	35
1981	BA	31	MA	32	LLB/JD	35	MA	37	PhD	29	MD	41	BA	35

Table 15 (continued)
Most Frequently Planned Degree by Field

Year	Education		Engineering		Physical Science		Health Technology		Social Science		"Undecided"	
	Degree	%	Degree	%	Degree	%	Degree	%	Degree	%	Degree	%
1967	BA	50%	MA	44%	MA	37%	BA	54%	MA	48%	BA	45%
1972	BA	40	BA	34	MA	32	BA	43	MA	32	BA	40
1975	MA	35	MA	38	PhD	26	BA	33	MA	26	BA	28
1981	MA	38	MA	43	MA	30	MD	39	MA	27	MA	29

Table 16

Mean Percentages of Humanities and Nonhumanities Students Planning Degrees by Type of Degree

Year	AA		BA		MA		PhD	
	Humanities $\bar{X}$	Nonhumanities $\bar{X}$	Humanities $\bar{X}$	Nonhumanities $\bar{X}$	Humanities $\bar{X}$	Nonhumanities $\bar{X}$	Humanities $\bar{X}$	Nonhumanities $\bar{X}$
1967	1%	4%	34%	37%	38%	35%	19%	15%
1972	1	3	22	33	31	28	16	12
1975	.64	2	20	25	28	26	17	12
1981	1	3	18	24	30	29	17	13

Table 16 (continued)

Mean Percentages of Humanities and Nonhumanities Students Planning Degrees by Type of Degree

Year	MD		LLB/JD		BD/M.Div.	
	Humanities $\bar{X}$	Nonhumanities $\bar{X}$	Humanities $\bar{X}$	Nonhumanities $\bar{X}$	Humanities $\bar{X}$	Nonhumanities $\bar{X}$
1967	.94%	3%	2%	.85%	.3%	.18%
1972	.83	4	6	3	1	.19
1975	2	11	14	5	2	.33
1981	2	13	17	5	1	.22

Table 17

Fields with the Highest and Lowest Percentages of Students Indicating Very Good Chance of Academic Outcomes

	Highest		Lowest	
Year	Field	%	Field	%
		Fail one or more classes		
1967	"Undecided"	4%	Language and Literature	2%
	Philosophy	4	Physical Science	2
1972	Philosophy	4	Language and Literature	1
	History	4	Physcial Science	2
1975	Philosophy	3	Health Technology	.97
	"Undecided"	3	Language and Literature	1
1981	Philosophy	4	Health Technology	.95
	Education	2	Language and Literature	1
		Re elected to honor society		
1967	Physical Science	8	Business	1
	Philosophy	7	Education	2
1972	Language and Literature	21	Philosophy	12
	Education	21	"Undecided"	15
1975	Physical Science	14	Education	3
	Language and Literature	12	Business	5
1981	Philosophy	16	Education	6
	English	15	"Undecided"	7
		Graduate with honors		
1967	Philosphy	9	Education	1
	Physical Science	9	Health Technology	2
1972	Physical Science	15	Education	4
	Philosophy	13	Health Technology	5
1975	Physical Science	20	Education	7
	Biology	18	"Undecided"	8
1981	Philosophy	22	Education	6
	English	19	"Undecided"	9

Table 18

Most Frequently Chosen Career by Field

Year	Other Humanities		English		History		Language and Literature	
	Career	%	Career	%	Career	%	Career	%
1967	Artist	41%	School Personnel	53%	School Personnel	46%	School Personnel	35%
1972	Artist	17	School Personnel	32	School Personnel	28	School Personnel	21
1975	Artist	35	Writer or Journalist	26	"Undecided"	28	"Undecided"	29
1982	Artist	45	Writer or Journalist	28	"Undecided"	18	Foreign Service Worker	22

Table 18 (continued)

Most Frequently Chosen Career by Field

Year	Philosophy		Biology		Business		Education		Engineering	
	Career	%	Career	%	Career	%	Career	%	Career	%
1967	"Undecided"	29%	Researcher	31%	Business Person	61%	School Personnel	91%	Engineer	81%
1972	"Undecided"	29	Researcher	27	Business Person	57	School Personnel	71	Engineer	70
1975	"Undecided"	26	Medical Professional	47	Business Person	66	School Personnel	73	Engineer	70
1982	"Undecided"	22	Medical Professional	46	Business Person	73	School Personnel	66	Engineer	80

Table 18 (continued)

Most Frequently Chosen Career by Field

Year	Physical Science		Health Technology		Social Science		"Undecided"	
	Career	%	Career	%	Career	%	Career	%
1967	Researcher	37%	Medical Professional	59%	Health Professional	34%	"Undecided"	73%
1972	Researcher	28	Health Professional	77	Social Worker	21	"Undecided"	70
1975	Researcher	34	Health Professional	71	Health Professional	16	"Undecided"	75
1982	Researcher	33	Medical Professional	71	"Undecided"	14	"Undecided"	73

Table 19

Fields with the Highest and Lowest Percentages of Students Indicating Very Good Chance of Changing Career Plans

Year	Highest Field	%	Lowest Field	%
		Change career choice		
1967	"Undecided"	58%	Engineering	10%
	Philosophy	43	Health Technology	11
1972	"Undecided"	58	Health Technology	10
	Philosophy	42	Engineering	11
1975	"Undecided	55	Health Technology	6
	Philosophy"	34	Engineering	9
1981	"Undecided"	55	Engineering	7
	Philosophy	38	Health Technology	7
		Change major field of study		
1967	Philosophy	39	Engineering	10
	English	25	Health Technology	11
1972	Philosophy	39	Engineering	10
	English	27	Health Technology	11
1975	Philosophy	34	Health Technology	6
	English	25	Engineering	9
1981	Philosophy	38	Health Technology	8
	English	26	Engineering	8

Table 20

Fields with the Highest and Lowest Percentages of Students Rating Productivity Related Aspirations as Very Important

Year	Highest Field	%	Lowest Field	%
		Contribution to science		
1967	Biology	44%	Education	2%
	Physical Science	40	English	3
1972	Biology	38	Language and Literature	2
	Physical Science	32	English	3
1975	Physical Science	40	Language and Literature	3
	Biology	39	English	4
1981	Biology	45	Language and Literature	3
	Physical Science	43	Business	4
		Writing original works		
1967	English	51	Business	6
	Philosophy	50	Engineering	6
1972	English	54	Engineering	6
	Philosophy	46	Business	7
1975	English	63	Business	6
	Philosophy	46	Engineering	7
1981	English	60	Business	6
	Philosophy	47	Engineering	7

Table 20 (continued)

Fields with the Highest and Lowest Percentages of Students Rating Productivity Related Aspirations as Very Important

Year	Highest Field	%	Lowest Field	%
	Creating artistic works			
1967	Other Humanities	49%	Engineering	6%
	Philosophy	33	Business	6
1972	Other Humanities	50	Engineering	8
	Philosophy	35	Business	8
1975	Other Humanities	44	Engineering	7
	Philosophy	27	Business	8
1981	Other Humanities	42	Business	7
	Philosophy	26	Health Technology	8
	Becoming accomplished in performing arts			
1967	Other Humanities	41	Engineering	5
	Philosophy	20	Business	6
1972	Other Humanities	[illegible]	Engineering	5
	Philosophy	23	Business	6
1975	Other Humanities	44	Engineering	5
	English	22	Business	6
1981	Other Humanities	45	Engineering	6
	Philosophy	25	Business	7

Table 21

Fields with the Highest and Lowest Percentages of Students Rating Success Related Aspirations as Very Important

	Highest		Lowest	
Year	Field	%	Field	%
		Being well off financially		
1967	Business	60%	Philosophy	22%
	Engineering	57	English	29
1972	Business	53	Philosophy	18
	Physical Science	34	English	25
1975	Business	60	Philosophy	26
	Engineering	54	Language and Literature	34
1981	Business	73	Philosophy	37
	Engineering	66	Education	46
		Success in own business		
1967	Business	67	Philosophy	21
	Engineering	49	Language and Literature	27
1972	Business	61	English	22
	Engineering	46	Philosophy	23
1975	Business	60	Language and Literature	23
	Biology	39	Philosophy	24
1981	Business	64	Education	28
	Social Science	45	Language and Literature	29

Table 21 (continued)

Fields with the Highest and Lowest Percentages of Students Rating Success Related Aspirations as Very Important

	Highest		Lowest	
Year	Field	%	Field	%
	Recognition from colleagues			
1967	Other Humanities	47%	"Undecided"	28%
	Engineering	47	Education	32
1972	Other Humanities	44	"Undecided"	26
	Engineering	40	Language and Literature	28
1975	Other Humanities	49	"Undecided"	33
	Engineering	45	Philosophy	35
1981	Other Humanities	62	"Undecided"	44
	Social Science	57	Education	47

Table 22

Fields with the Highest and Lowest Percentages of Students Rating Values Related Aspirations as Very Important

Year	Highest Field	%	Lowest Field	%
	Helping others in difficulty			
1967	Health Technology	80%	Engineering	45%
	Education	77	Physical Science	52
1972	Social Science	77	Engineering	52
	Education	76	Physical Science	52
1975	Social Science	79	Engineering	50
	Health Technology	78	Business	57
1981	Health Technology	80	Engineering	52
	Social Science	77	Physical Science	57
	Developing philosophy of life			
1967	Philosophy	97	Engineering	76
	English	93	Business	79
1972	Philosophy	92	Engineering	62
	English	82	Business	62
1975	Philosophy	92	Education	32
	English	80	Health Technology	34
1981	Philosophy	86	Business	46
	English	73	Education	47

Table 22 (continued)

Fields with the Highest and Lowest Percentages of Students Rating Values Related Aspirations as Very Important

	Highest		Lowest	
Year	Field	%	Field	%
	Keeping up to date with politics			
1967	History	71%	Health Technology	46%
	Social Science	71	"Undecided"	50
1972	History	67	Education	44
	Social Science	62	Health Technology	44
1975	History	69	Education	32
	Social Science	61	Business	40
1981	History	76	Education	31
	Social Science	66	Health Technology	37

Table 23[a]

Probable Major Field of All Freshmen By All Institutions

Major	1970	1972	1975	1979	1983
English	3.0%	1.6%	1.0%	0.9%	0.9%
Arts, Humanities	12.7	12.4	8.3	7.7	6.5
Education	11.6	7.3	9.9	8.4	6.0
History, Political Science	5.4	3.9	3.5	2.6	2.4
Social Sciences	8.9	7.8	6.2	5.5	4.2
Business	16.2	15.5	18.9	24.3	24.4
Mathematics, Statistics	3.3	2.2	1.1	0.6	0.8
Physical Sciences	2.3	1.9	2.7	2.3	1.8
Engineering	8.6	6.9	7.9	10.6	11.7
Biological Sciences	3.5	3.9	6.3	4.0	3.8
Agriculture (Inc, Forestry)	2.0	3.2	3.9	3.0	1.9
Health Professional (Non-M.D.)	7.4	10.6	7.3	7.9	11.9
Other	12.9	18.2	18.0	17.4	18.8
Undecided	2.2	4.6	5.0	4.8	4.9

a) Astin et al., 1970 - 1983

Appendix A
Sampling Scheme

Sampling Scheme

	Other Humanities	English	History	Language Literature	Philosophy	Biology	Business	Education	Engineering	Physical Science	Health Tech.	Social Science	"Undecided"
						1967 (N = 82,922)							
Ratio						1/2	1/12	1/8	1/8	1/3	1/8	1/8	1/2
Sample N	20474	10600	5955	8315	1479	3340	4186	2919	4792	4209	6704	7703	2246
						1972 (N = 74,452)							
Ratio						1/2		1/8	1/8	1/3	1/8	1/8	1/2
Sample N	28645	4912	3893	4419	1019	5831		2162	2147	4245	3168	3631	6194
						1975 (N = 70,266)							
Ratio						1/2	1/12	1/8	1/8	1/3	1/8	1/8	1/2
Sample N	20264	3899	3653	2893	695	11003	3293	2855	2643	4190	3389	3361	6737
						1981 (N = 52,824)							
Ratio						1/4	1/12	1/8	1/10	1/3	1/8	1/8	1/2
Sample N	17110	3734	2231	1962	525	3178	3982	1610	3002	3016	3272	2593	6609