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# RESEARCH REPORTS

## A DESCRIPTION OF COLLEGE FRESHMEN: II. STUDENTS WITH DIFFERENT VOCATIONAL CHOICES

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# A Description of College Freshmen: II. Students with Different Vocational Choices

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Despite several decades of interest in vocational decisions, the description of people aspiring to or employed in various vocations is still insufficient for educational and vocational guidance and for research. The present study describes college freshmen preparing for different vocations. We have assumed that these descriptions of prospective recruits have the following desirable properties: First, the descriptive variables, which are generally the product of simple, direct assessments of student characteristics, are easily interpreted by students, counselors, and faculty. And secondly, since most descriptions of single vocations and groups of vocations are based on large national samples of college students, the results are generally reliable and more universal in nature.

The student sample and the assessment devices used in this study, which are explained in the following section, The Student Survey, are the same as those used in an earlier study, A Description of College Freshmen: I. Students with Different Choices of Major Field (Abe & Holland, 1965). The analysis of the data in both studies is similar. If you have read the earlier descriptive study of major fields, you may omit this next section, since it merely reiterates what you have learned

earlier, and go to the section, Vocations and Their Prospective Recruits, on page 11. If you have not read the earlier report, or if you do not remember clearly the scales involved in the survey, you should read the next section, so you can more readily understand the rest of the report.

## The Student Assessment

The present study grew out of the American College Survey (Abe, Holland, Lutz, & Richards, 1965), a project conducted by the American College Testing Program to obtain a more complete account of the typical American college student and of the variation among students from college to college. To accomplish these tasks, a comprehensive assessment was given to 12,432 college freshmen at 31 institutions of higher education in the spring of 1964. The following sections describe the student sample, the materials, and the scales contained in the student survey.

### The Student Sample

Table 1 names the colleges that participated in the project, the number of students at each of these colleges, and the rate of participation for each college. This table shows that students in coeducational colleges are somewhat over-represented and that students in West Coast colleges are considerably under-represented. However, the over-all impression given by this table is that a reasonable cross-section of American college freshmen in 1964 was attained.

The number of freshmen and the percentage of the freshman class

Table 1

The Participating Colleges and the Percentage of Freshmen Who Responded to the American College Survey

| College | State | Men | Women | % of Total Fresh. Class |
|---|---|---|---|---|
| Arkansas Polytechnic College | Arkansas | 155 | 94 | 34 |
| Baylor University | Texas | 207 | 273 | 44 |
| Black Hills Teachers College | South Dakota | 102 | 74 | 46 |
| Bloom Township Community College | Illinois | 102 | 46 | 70 |
| Burlington Community College | Iowa | 135 | 72 | 96 |
| California State College at Hayward | California | 144 | 186 | 60 |
| Carthage College | Wisconsin | 33 | 89 | 44 |
| Colorado State College | Colorado | 62 | 172 | 22 |
| Fairmont State College | West Virginia | 187 | 152 | 76 |
| Glassboro State College | New Jersey | 178 | 529 | 80 |
| Indiana State College | Indiana | 233 | 333 | 28 |
| Jamestown Community College | New York | 77 | 83 | 64 |
| Kansas State University | Kansas | 641 | 511 | 73 |
| Lyons Township Junior College | Illinois | 50 | 53 | 57 |
| Mount Mercy College | Pennsylvania | -- | 150 | 91 |
| New Mexico State University | New Mexico | 198 | 81 | 29 |
| Plymouth State College | New Hampshire | 59 | 115 | 72 |
| Snow College | Utah | 82 | 63 | 49 |
| Southeastern State College | Oklahoma | 143 | 107 | 62 |
| Southern Connecticut State College | Connecticut | 147 | 398 | 77 |
| Southern Illinois University | Illinois | 762 | 363 | 33 |
| Springfield College | Massachusetts | 145 | 85 | 54 |
| Swarthmore College | Pennsylvania | 69 | 50 | 44 |
| University of Alabama | Alabama | 429 | 387 | 43 |
| University of Kentucky | Kentucky | 711 | 616 | 63 |
| University of North Dakota | North Dakota | 226 | 272 | 49 |
| University of Tennessee | Tennessee | 597 | 474 | 47 |
| Wesleyan University | Connecticut | 287 | -- | 94 |
| Westbrook Junior College | Maine | -- | 169 | 81 |
| William Carey College | Mississippi | 30 | 47 | 47 |
| William Jewell College | Missouri | 98 | 99 | 81 |
| Total Students | | 6289 | 6143 | |

participating in the American College Survey varied greatly from college to college. At one extreme, 94 per cent of the Burlington Community College freshmen participated, while at the other, Colorado State College submitted a selected sample of 22 per cent of their freshmen. The rate of participation in most instances was quite satisfactory.

The Student Survey

The American College Survey (1964), the device used to assess the various student characteristics, is a booklet which contains a letter explaining the purpose of the survey, and 1004 items which are concerned with such orientations as a student's interests, potential for various kinds of achievement, and attitudes. The following sections summarize our knowledge of the scales and assessment devices contained in the American College Survey.

Vocational Preference Inventory (Fifth Revision). This personality and interest inventory is composed entirely of occupational titles (Holland, 1958). To take the inventory, a student indicates which occupations he likes and dislikes. Scores on only the following scales were used for this study: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-Control, Aggressive, Masculine, Status, and Acquiescence. Reliabilities (Kuder-Richardson 20) ranged from .57 to .89 for 6289 male college freshmen and from .50 to .89 for 6143 females. For the present descriptive study, it is useful to interpret the VPI as an inventory of vocational interests. The VPI scales used and their "interest" interpretations are as follows:

| Scale | Preference for: |
|---|---|
| Realistic | technical and skilled trades |
| Intellectual | scientific occupations |
| Social | teaching and helping occupations |
| Conventional | clerical occupations |
| Enterprising | supervisory and sales occupations |
| Artistic | artistic, musical, and literary occupations |
| Self-Control | aversion to occupations involving risk of physical injury, adventure, and danger |
| Aggressive | occupations of great power and status such as UN Diplomat, College President, Prosecuting Attorney |
| Masculine | occupations typical of men |
| Status | prestigeful occupations such as Lawyer, Doctor, Business Executive |
| Acquiescence | number of preferred occupations |

Potential Achievement Scales. In an earlier study of National Merit Finalists (Holland & Nichols, 1964), Potential Achievement Scales were constructed empirically by sex for the prediction of six kinds of extracurricular achievement: art, music, writing, science, dramatics, and leadership. The students falling in the upper and lower 27 per cent on checklists of accomplishments for these fields in high school indicated their preferences for 273 daily activities, hobbies, reading habits, school subjects, and sports. Typical items included working on guns,

building scientific equipment, playing chess, going to a public library, giving talks, collecting rocks, playing charades, and drawing cartoons. In the first study of these scales only the 15 most discriminating items were used, and item-criterion correlations ranged from .24 to .80. In the present study, all scales were lengthened by adding from 3 to 14 items per scale. These additions were intended to increase the reliability and perhaps the validity of the Potential for Achievement Scales. The lengthened scale reliabilities (Kuder-Richardson) ranged from .77 to .87 for men and from .72 to .85 for women.

Extracurricular Achievement Record. The checklists of extracurricular accomplishment for the high school years were used earlier by Holland and Nichols (1964) and include the following areas: art, music, literature, dramatic arts, leadership, and science. The score on each scale is simply the number of accomplishments checked. Students with high scores on one or more of these scales have attained a high level of accomplishment, characterized by complex skills, persistence, and originality. The reliabilities (K-R 21) for individual records of accomplishment range from .48 to .75 for men and from .58 to .86 for women for National Merit Finalists. In a diverse group of college freshmen, the reliabilities (K-R 20) ranged from .72 to .84 for men and from .65 to .81 for women.

Preconscious Activity Scale. This scale is an a priori scale developed to measure Kubie's (1958) notion of preconscious activity as a process in creative performance (Nichols & Holland, 1963). The

Preconscious Activity Scale is a 38-item true-false scale with reliabilities (K-R 20) of .72 and .68 for male and female college freshmen. The predictive and concurrent validities of this scale with originality and interest measures imply that the Preconscious Activity Scale should be interpreted as an originality measure, especially in the fields of art, literature, and music (Nichols & Holland, 1963).

Range of Competencies. From a list of 143 activities, students checked those they could do well or competently. These scales assume that a large number of abilities contributes to achievement generally and abilities in a particular field contribute to achievement in that field. Typical items from this list included: I have a working knowledge of Robert's Rules of Order, I can dance, I am a good cook, I can make jewelry, I can read blueprints, I can read Greek, I can operate a tractor, I can use logarithm tables, etc. The number of activities checked equals a student's range of competencies. Three judges categorized the items into several areas of competence: scientific, technical, governmental, athletic, business, social and educational, homemaking, arts, leadership and sales, and foreign language. Students were then scored for each kind of competency. The reliability (K-R 20) for the total number of competencies claimed was .94 and .93 for male and female college freshmen; the reliabilities for the special competency scales ranged from .35 to .87 and from .11 to .85 for men and women. The very low reliabilities for a few scales probably result from the small number of items in such scales.

Interpersonal Competency Scale. This a priori scale of twenty

items was modeled after the work of Foote and Cottrell (1955). Having defined interpersonal competence as "acquired ability for effective interaction," they outlined a program of research to study this concept. Scale items simply poll the subject for those factors which Foote and Cottrell believe to be conducive to, or typical of interpersonal competency--good health, social experience, social competencies, positive self-regard. The reliability (K-R 20) of the Interpersonal Competency Scale for groups of 6289 male and 6143 female college freshmen was .69 and .67 respectively.

Range of Experience. The assumption underlying the development of this scale is that breadth of experience contributes to achievement. Students checked their experiences from a list of 76 items. Typical examples included: museum, factory, gambling casino, summer camp, mental hospital, sports car race. The score on this scale is the number of experiences checked. The reliability (K-R 20) was .92 and .90 for male and female college freshmen.

Intellectual Resources in the Home. The underlying assumption of this scale is that many environmental resources contribute to achievement. From a list of 39 items, students checked those found in their homes. Typical items included: an encyclopedia set, a tape recorder, sculpturing tools, a sewing machine, power tools, a library of more than 200 books. The number of items checked is the score. The reliability (K-R 20) of this scale was .81 for male college freshmen and .78 for female college freshmen.

Dogmatism Scale. This scale, developed by Rokeach (1956) to measure dogmatic and rigid thinking, consists of 40 true-false items concerned with beliefs and attitudes. (The first version by Rokeach is in multiple choice form.) The reliability (K-R 20) for 6289 male college freshmen was .77 and for 6143 female college freshmen was .75.

Student Orientation Survey, Form C. Farber and Goodstein (1964) developed four a priori scales to assess the student orientations implied in Trow's student typology (1960). These scales are Academic, Collegiate, Non-conforming, and Vocational. The a priori scales were revised by an internal consistency item analysis to develop homogeneous, 10-item scales. Reliabilities (K-R 20) ranged from .39 to .45 for male college freshmen and from .36 to .50 for females.

Other Descriptive Information. Students were polled for such background information as their educational and economic aspirations, their life goals, and their self-ratings. They were asked to indicate their choice of vocation and field of training. Their high school grades and ACT scores were available from college records. Students indicated whether 35 different life goals and achievements (such as, being a religious person, making a contribution to scientific knowledge, being happy and content) were "essential, very important, somewhat important, or of little importance" to them. Using a list of 31 traits and abilities, such as originality, scholarship, and conservatism, students rated themselves on a four-point scale--top 10%, above average, average, and below average.

Table 2 summarizes the reliability coefficients (K-R 20) for all descriptive scales and indicates the number of items in each scale. Generally, the scales possess moderate to high homogeneity. Scales with low coefficients are usually brief scales or scales with marked heterogeneity of content.

Table 2

Kuder-Richardson Reliabilities for the Descriptive Scales of the American College Survey

| Scale | No. of Items | | Reliability | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 1. Realistic | 14 | 14 | .85 | .77 |
| 2. Intellectual | 14 | 14 | .89 | .89 |
| 3. Social | 14 | 14 | .84 | .82 |
| 4. Conventional | 14 | 14 | .87 | .83 |
| 5. Enterprising | 14 | 14 | .83 | .76 |
| 6. Artistic | 14 | 14 | .88 | .88 |
| 7. Self-Control | 14 | 14 | .86 | .85 |
| 8. Aggressive | 14 | 14 | .84 | .83 |
| 9. Masculine | 14 | 14 | .57 | .50 |
| 10. Status | 14 | 14 | .71 | .60 |
| 11. Acquiescence | 30 | 30 | .76 | .76 |
| 12. Leadership Potential | 29 | 20 | .86 | .77 |
| 13. Literary Potential | 18 | 20 | .84 | .72 |
| 14. Artistic Potential | 20 | 24 | .79 | .85 |
| 15. Scientific Potential | 23 | 24 | .81 | .80 |
| 16. Musical Potential | 18 | 21 | .87 | .74 |
| 17. Dramatic Arts Potential | 18 | 23 | .77 | .82 |
| 18. Range of Experience | 76 | 76 | .92 | .90 |
| 19. Intellectual Home Resources | 39 | 39 | .81 | .78 |
| 20. Scientific Achievement | 15 | 15 | .80 | .81 |
| 21. Leadership Achievement | 14 | 14 | .72 | .65 |
| 22. Dramatic Arts Achievement | 13 | 13 | .75 | .72 |
| 23. Artistic Achievement | 12 | 12 | .84 | .81 |
| 24. Literary Achievement | 8 | 8 | .73 | .70 |
| 25. Musical Achievement | 15 | 15 | .84 | .77 |

Table 2 (cont.)

| Scale | No. of Items | | Reliability | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 26. Total Competencies | 143 | 143 | .94 | .93 |
| 27. Scientific Competency | 11 | 11 | .70 | .67 |
| 28. Technical Competency | 23 | 23 | .83 | .76 |
| 29. Government & Social Studies Competency | 2 | 2 | .57 | .54 |
| 30. Athletic Competency | 11 | 11 | .71 | .70 |
| 31. Business & Clerical Competency | 5 | 5 | .48 | .38 |
| 32. Social & Educational Competency | 13 | 13 | .78 | .74 |
| 33. Homemaking Competency | 24 | 24 | .86 | .85 |
| 34. Arts Competency | 34 | 34 | .87 | .85 |
| 35. Leadership & Sales Competency | 12 | 12 | .80 | .79 |
| 36. Foreign Language Competency | 6 | 6 | .35 | .11 |
| 37. Preconscious Activity (Originality) | 38 | 38 | .72 | .68 |
| 38. Dogmatism | 40 | 40 | .77 | .75 |
| 39. Academic Type | 10 | 10 | .45 | .42 |
| 40. Vocational Type | 10 | 10 | .39 | .36 |
| 41. Non-Conformist Type | 10 | 10 | .42 | .43 |
| 42. Collegiate Type | 10 | 10 | .45 | .50 |
| 43. Interpersonal Competency | 20 | 20 | .69 | .67 |

Note.--This table is based on the total student samples of 6,289 men and 6,143 women.

## Vocations and Their Prospective Recruits

The vocational choices and the number of students planning to enter each vocation are shown in Table 3. Vocations with less than 10 prospective students were eliminated from further study. Similarly, students who were undecided or gave no response or unclassifiable responses were omitted.

Table 3

The Distribution of Students by Anticipated Vocational Choice

| Vocational Choice | Men | Women | Vocational Choice | Men | Women |
|---|---|---|---|---|---|
| Accounting | 279 | 42 | English, Creative Writing | 42 | 52 |
| Administration & Supervision | 8 | 2 | English Education | 67 | 306 |
| Aeronautical Engineering | 77 | 9 | Experimental & General Psych. | 23 | 12 |
| Agricultural Science | 166 | 15 | | | |
| Anthropology | 12 | 2 | | | |
| Architecture | 83 | 8 | Farming | 61 | 3 |
| Art | 45 | 92 | Finance | 91 | 7 |
| Art Education | 29 | 93 | Foreign Language Education | 17 | 117 |
| Astronomy, astrophysics | 14 | 6 | Foreign Service | 35 | 36 |
| | | | Forestry | 105 | 1 |
| Bio-chemistry | 15 | 12 | | | |
| Biology | 55 | 40 | General Humanities | 11 | 8 |
| Botany | 12 | 3 | General Social Sciences | 8 | 8 |
| Business Education | 23 | 89 | | | |
| Chemical Engineering | 94 | 2 | Geography | 12 | 4 |
| Chemistry | 87 | 25 | Geology, geophysics | 19 | 3 |
| Civil Engineering | 185 | 6 | | | |
| Clerical | 6 | 94 | | | |
| Clinical Psychology | 42 | 48 | History | 57 | 24 |
| Counseling & Guidance | 36 | 76 | History Education | 202 | 154 |
| | | | Home Economics | 5 | 184 |
| Dentistry | 120 | 32 | Home Economics Education | 3 | 153 |
| Drama | 19 | 18 | | | |
| | | | Housewife | 0 | 122 |
| Economics | 14 | 4 | | | |
| Education, General and Other | 22 | 29 | Industrial Arts Education | 50 | 1 |
| Education of Exceptional Children | 8 | 145 | Industrial Engineering | 37 | 0 |
| Educational Psychology | 9 | 15 | Industrial & personnel psychology | 17 | 8 |
| Electrical Engineering | 259 | 4 | | | |
| Elementary Education | 117 | 1497 | Journalism, Radio-TV, Communication | 58 | 57 |
| Engineering, General and Other | 65 | 2 | | | |
| Engineering Science | 44 | 4 | | | |

Table 3 (cont.)

| Vocational Choice | Men | Women |
|---|---|---|
| Law | 288 | 32 |
| Library Science | 6 | 32 |
| Literature | 10 | 22 |
| Management | 360 | 22 |
| Marketing | 45 | 5 |
| Mathematics, Statistics | 80 | 54 |
| Math Education | 138 | 114 |
| Mechanical Engineering | 152 | 1 |
| Medical Technology | 9 | 111 |
| Medicine | 354 | 79 |
| Metallurgical Engineering | 14 | 0 |
| Metallurgy | 0 | 1 |
| Meteorology | 3 | 2 |
| Military Science | 80 | 0 |
| Modern Foreign Language | 6 | 42 |
| Music | 41 | 43 |
| Music Education | 63 | 74 |
| Natural Science Education | 86 | 45 |
| No near equivalent in list | 181 | 139 |
| Not full-time & not housewife | 2 | 6 |
| Nursing | 4 | 301 |
| Oceanography | 9 | 1 |
| Other Biological Sciences | 36 | 21 |
| Other Business & Commercial | 39 | 9 |
| Other Fine & Applied Arts | 10 | 11 |
| Other Health Fields | 14 | 51 |
| Pharmacy | 51 | 15 |
| Philosophy | 10 | 2 |
| Physical Education, Recreation, Health | 272 | 239 |
| Physical Science, General and Other | 5 | 0 |
| Physical Therapy | 9 | 32 |
| Physics | 61 | 7 |
| Physiology | 12 | 6 |
| Political Science | 76 | 32 |
| Public Administration | 19 | 4 |
| Public Relations, Advertising | 40 | 13 |
| Purchasing | 16 | 55 |
| Sales | 64 | 25 |
| Secretarial Science | 3 | 267 |
| Social Work | 19 | 140 |
| Sociology | 15 | 34 |
| Speech | 10 | 22 |
| Theology, religion | 77 | 34 |
| Trade & Industrial Education | 27 | 0 |
| Undecided or don't know | 451 | 295 |
| Veterinary Medicine | 120 | 16 |
| Zoology | 33 | 13 |

Note.--Samples of less than 10 for either sex were not used for this study; categories which do not represent specific fields were also omitted: "undecided, no near equivalent in list."

For each vocation selected by 10 or more students (76 vocations for men; 58 vocations for women) the mean and standard deviation were computed for 117 student characteristics. The student characteristics were assumed to differentiate among the vocational choices. A partial test of this assumption was made by computing simple analyses of variance for 53 of the 117 student variables; statistically significant results were obtained for both sexes for 52 of these 53 variables. Only the self-rating of "self-sufficiency" failed to differentiate among choices of vocation.

Since the statistically significant findings are so extensive, we are reporting only the most distinctive findings. Accordingly, the vocations with the highest and lowest means on each of the 117 characteristics were identified. A summary of these distinctive characteristics was prepared for each vocational choice. In the following tables, a "high" variable listed for a group is the student variable with the highest average score among the average scores for all 76 male or 58 female vocational choices. For example, in the Physical Sciences, the highest average score on scientific achievement (variable 20) is for men whose vocational choice is physics; the groups of men selecting the remaining 75 vocational choices have lower average scores for scientific achievement. The "low" variables listed for each group of vocational choices are those student variables with the lowest average score among the average scores for all 76 male or 58 female choices of vocation. Accordingly, the "high" variables should be interpreted as the positive poles of the scales

or ratings, and the scale name indicates the interpretation. For example, "High: Science Achievement" means many scientific achievements, "High: Dogmatism" means very dogmatic. Similarly, "Low: Science Achievement" means few scientific achievements.

The vocational choices for our student sample were then grouped into 13 conventional areas: physical sciences, biological sciences, humanities, social sciences, agriculture, business and administration, education, political science and law, health professions, engineering, creative arts, vocational and trade, and military science. The characteristics which were the most descriptive of the students with vocational choices in these areas were tabulated.

The characteristics of students planning to enter the various fields are summarized in Tables 4 through 16. Each table combines the characteristics of several related vocational choices. While a given entry in a table applies only to a single vocation in the group, it is assumed that the classification scheme is sufficiently homogeneous to permit generalization to all vocations in the group. Since this assumption is not always tenable, a problem which most a priori classifications face, the following descriptions contain some inappropriate classifications and concomitant descriptive error.

Physical Sciences (astronomy, astrophysics, chemistry, physics, geography, geology, geo-physics, mathematics, and statistics)

Men planning a scientific vocation are high on science achievement and dogmatism. They rate themselves as being high on mathematical and

scientific ability. Important goals for these future scientists include inventing or developing a useful product or device, being an authority on a special subject in their field, making their parents proud, and keeping in good physical condition. Finding a suitable mate is also important to them.

These future scientists have relatively few intellectual home resources, score low on interpersonal competency. They tend not to date or to date different persons rather than go steady or be engaged or married. They rate themselves as being low on leadership, aggressiveness, writing ability, cheerfulness, and perseverance. Goals that are relatively unimportant to these future male scientists include helping others who are in difficulty, being influential in public affairs, following a formal religious code, being a good parent, and finding a real purpose in life.

Compared to the rather complete description of the male, one finds few distinctive characteristics for the female scientist, perhaps because few women in our sample plan to enter scientific vocations. The women rate themselves high on mathematical ability and scholarship. An important goal to them is being self-sufficient. They have few social and educational competencies and relatively few have consulted with a professional person about a personal problem.

Table 4

Student Characteristics associated with

the Choice of Physical Sciences

| High Means | |
|---|---|
| **Men** | **Women** |
| SR - mathematical ability | SR - mathematical ability |
| Science Achievement | SR - scholarship |
| Dogmatism | G - self-sufficient |
| SR - scientific ability | |
| G - inventing or developing a useful product or device | |
| G - making parents proud | |
| G - authority on special subject in my field | |
| G - good physical condition | |
| Importance of Finding Suitable Mate | |
| **Low Means** | |
| Intellectual Home Resources | Social and Educational Competency |
| Interpersonal Competency | Consultation with Professional Person |
| SR - leadership | |
| SR - aggressiveness | |
| SR - writing ability | |
| SR - cheerfulness | |
| SR - perseverance | |
| G - helping others who are in difficulty | |
| G - influential in public affairs | |
| G - following formal religious code | |
| G - good parent | |
| G - finding real purpose in life | |
| Psycho-Sexual Status | |

Biological Sciences (biology, bio-chemistry, botany, physiology, zoology, other biological science fields)

The men and women planning biological vocations have the following traits in common: They are high on intellectual interests and science competency. They are low on enterprising interests and leadership

potential. Important goals for them are making theoretical and technical contributions to science. Unimportant goals are being an expert in finance and commerce and avoiding hard work.

In addition, the men have a need for achievement, but say they are conservative and passive. They have little potential in the fine arts, and are not adept in social or homemaking situations. Compared to other students, they are less interested in being self-sufficient, a finding that is somewhat surprising but in line with their other traits.

On the other hand, the women are high on most of the variables dealing with science, including ability, potential, and achievement. They appear to have a need for acceptance. They are not adept in interpersonal relationships and have relatively little interest in community affairs or politics.

An over-all view of these men and women who plan to pursue a biological science vocation reveals that, although there are some similarities between the men and the women, there are many more differences. Interestingly enough, the women planning to enter a biological science vocation are more like the men planning to enter a physical science vocation.

Table 5

Student Characteristics associated with the Choice of Biological Sciences

| High Means | |
|---|---|
| Men | Women |
| Intellectual (VPI) | Intellectual (VPI) |
| Scientific Competency | Scientific Competency |

Table 5 (cont.)

High Means

| Men | Women |
|---|---|
| G - theoretical contribution to science | G - theoretical contribution to science |
| G - technical contribution to science | G - technical contribution to science |
| SR - drive to achieve | Scientific Potential |
| SR - conservatism | Scientific Achievement |
| | Expected Vocational Achievement |
| | SR - scientific ability |
| | SR - research ability |
| | SR - physical health |
| | G - inventing, developing useful product or device |
| | G - authority on special subject in my field |
| | G - making parents proud |
| | G - mature and well-adjusted person |
| | G - being well-liked |
| | G - good spouse |
| | G - good parent |
| | G - finding real purpose in life |

Low Means

| Men | Women |
|---|---|
| Enterprising (VPI) | Enterprising (VPI) |
| Leadership Potential | Leadership Potential |
| G - expert in finance and commerce | G - expert in finance and commerce |
| G - avoiding hard work | G - avoiding hard work |
| Aggressive (VPI) | Total Competencies |
| Artistic Potential | Athletic Competency |
| Dramatic Arts Potential | Interpersonal Competency |
| Social & Educational Competency | SR - understanding of others |
| Homemaking Competency | SR - writing ability |
| SR - sociability | SR - cheerfulness |
| SR - self-control | G - becoming a community leader |
| SR - expressiveness | G - becoming influential in public affairs |
| SR - social self-confidence | G - keeping up-to-date politically |
| SR - popularity with opposite sex | G - successful in own business |
| G - self-sufficient | Importance of Finding Suitable Mate |

Engineering (civil, chemical, electrical, industrial, mechanical, metallurgical, engineering science, general engineering)

As there were not enough women (less than 10) seeking any of the engineering fields, the following findings are concerned only with the men who are planning to enter this area. They have masculine interests and are technically and mechanically oriented. They have few social interests and indicate little potential or achievement in the arts. They rate themselves low on originality and speaking ability, and do not aspire to education beyond the bachelor's degree.

In general, the potential engineer seems to be a he-man type with technical and mechanical skills, who disdains the cultural and creative aspects of life.

Table 6

Student Characteristics associated with the Choice of Engineering

| High Means (Male) |
|---|
| Masculine (VPI) |
| Scientific Potential |
| Technical Competency |
| Vocational Type |
| SR - mechanical ability |
| **Low Means (Male)** |
| Social (VPI) |
| Musical Potential |
| Literary Achievement |
| Musical Achievement |
| Government & Social Studies Competency |
| Highest Level of Education |
| SR - originality |
| SR - speaking ability |

Table 6 (cont.)

| Low Means (Male) |
| --- |
| G - accomplished in performing arts |
| G - writing good fiction |
| G - becoming accomplished musician |

Health Professions (dentistry, medicine, nursing, pharmacy, physical therapy, veterinary medicine, medical technology, other health fields)

The men are high on total competencies, expected income, satisfaction with college choice, and consultation with a professional person. An important goal for these future medical practitioners is being successful in their own business. Unimportant goals are being well-read and being up-to-date politically.

The women have realistic and masculine interests, which are reflected in their athletic, technical and mechanical abilities. They have a need for achievement, say they are self-controlled and practical-minded, and are relatively dogmatic. They show little interest in creative work.

Significantly, the men and women planning to enter the medical profession have no traits, self-ratings, or goals in common. Consequently, men planning to become doctors or dentists seem quite unlike the women who plan to be nurses, veterinarians, or medical technicians. The women seem to have more in common with the male engineers.

Table 7

Student Characteristics associated with

the Choice of Health Professions

| High Means | |
|---|---|
| Men | Women |
| Total Competencies | Realistic (VPI) |
| Expected Income | Masculine (VPI) |
| G - successful in own business | Technical Competency |
| Satisfaction with College Choice | Athletic Competency |
| Consultation with Professional Person | Dogmatism |
| | Vocational Type |
| | SR - mechanical ability |
| | SR - drive to achieve |
| | SR - self-control |
| | SR - practical mindedness |

| Low Means | |
|---|---|
| Men | Women |
| G - being well-read | Self-Control (VPI) |
| G - up-to-date politically | Literary Achievement |
| | SR - intellectual self-confidence |
| | SR - sense of humor |
| | G - helping others who are in difficulty |
| | G - writing good fiction |
| | G - obtaining awards or recognition |
| | G - producing good artistic work |
| | G - exciting and stimulating activities |

Agriculture (farming, forestry, agricultural science)

The men are not high on any of the 117 variables studied. They have relatively little interest in artistic or prestigious activities. They come from the smaller, rural high schools. They don't think that engaging in exciting and stimulating activities is important to them.

The women have a relatively wide range of experience and are satisfied with their college. They are low on many social variables, such

as status, sociability, and popularity with the opposite sex.

There is insufficient evidence to make generalizations about these students planning an agricultural vocation. It would appear, however, that they tend to come from the small rural school and frequently are following family tradition.

Table 8

Student Characteristics associated with the Choice of Agriculture

| Men | Women |
|---|---|
| **High Means** | |
| | Range of Experience<br>Satisfaction with College Choice |
| **Low Means** | |
| Status (VPI) | Status (VPI) |
| Artistic (VPI)<br>Foreign Language Competency<br>G - exciting and stimulating activities<br>Size of High School Class | Social (VPI)<br>Leadership and Sales Competency<br>SR - sociability<br>SR - social self-confidence<br>SR - popularity with opposite sex<br>G - mature and well-adjusted person<br>G - self-sufficient |

Education (elementary, English, foreign language, history, natural science, mathematics, physical education, health, recreation, exceptional children, general education, other)

The men and women in this subgroup rate themselves high on athletic ability and physical energy and being an outstanding athlete is an important goal. The women are also high on the goal of keeping in good physical condition.

In addition, the men have a relatively narrow range of experience and few athletic competencies. They show little interest in the following goals: being happy and content, inventing or developing a useful product or device, having a meaningful philosophy of life, and producing good artistic work. The women, on the other hand, are low on the self-ratings of understanding of others and popularity with the opposite sex.

Table 9

Student Characteristics associated with the Choice of Education Professions

| High Means | |
|---|---|
| Men | Women |
| SR - athletic ability<br>SR - physical energy<br>G - outstanding athlete | SR - athletic ability<br>SR - physical energy<br>G - outstanding athlete<br><br>G - good physical condition |
| **Low Means** | |
| Men | Women |
| Range of Experience<br>Athletic Competency<br>G - happy and content<br>G - inventing, developing useful product<br>G - meaningful philosophy<br>G - good artistic work | SR - understanding of others<br>SR - popularity with opposite sex |

Social Science (counseling and guidance, educational psychology, clinical psychology, industrial and personnel psychology, experimental and general psychology, anthropology, sociology, and social work)

These future social scientists are high on social interests and size of the high school graduating class. They rate themselves high on sensi-

tivity to the needs of others. They do not anticipate outstanding vocational achievement and being well-liked is relatively unimportant.

In addition to the above characteristics, the men are status-seeking, have a wide range of experience, and have many intellectual home resources. They are persevering, have few conventional interests, and have little athletic ability or physical energy. They are less independent than others, but making their parents proud of them is not an essential goal.

The women are acquiescent, understand others, and have a sense of humor. They have a wide range of competencies, but little self-control and poor physical health. They expect to make a considerable amount of money after they have graduated. They are not musically inclined.

In general, these future social scientists are socially oriented, interested in others, and from urban areas.

Table 10

Student Characteristics associated with

the Choice of Social Sciences

| High Means | |
|---|---|
| Men | Women |
| Social (VPI) | Social (VPI) |
| SR - sensitivity to the needs of others | SR - sensitivity to the needs of others |
| Size of High School Class | Size of High School Class |
| Status (VPI) | Acquiescence (VPI) |
| Range of Experience | Total Competencies |
| Intellectual Home Resources | Expected Income |
| SR - perseverance | SR - understanding of others |

Table 10 (cont.)

High Means

| Men | Women |
|---|---|
| | SR - sense of humor |

Low Means

| Men | Women |
|---|---|
| Expected Vocational Achievement | Expected Vocational Achievement |
| G - being well-liked | G - being well-liked |
| Conventional (VPI) | SR - self-control |
| Dramatic Arts Achievement | SR - physical health |
| Business and Clerical Competency | G - accomplished musician |
| SR - athletic ability | |
| SR - independence | |
| SR - physical energy | |
| G - authority on special subject in my field | |
| G - making parents proud | |
| G - active in religious affairs | |
| G - successful in own business | |

Vocational and Trade (home economics education, business education, trade and industrial education, industrial arts education, library science, home economics, housewife)

The men in this group have realistic interests, are acquiescent, and want to be good husbands. Compared to others, they are less skilled as leaders, writers, or artists. They are less sensitive to the needs of others, and have less confidence in their intellectual abilities.

The women are skilled homemakers, and wish to be good wives and parents. They are less skilled as leaders or athletes, and consider themselves less popular than others. They have little fine arts or scientific potential, and are not interested in being an authority on a special subject in their field.

From Table 11, one gets a fairly complete representation of the women planning to enter the vocational and trade vocations, while the information concerning the men is somewhat sparse. Since only three variables are common to males and females, this suggests that the present group of vocations is a heterogeneous one. Further, perhaps men and women need separate classification schemes.

Table 11

Student Characteristics associated with

Vocational and Trade Choices

| High Means | |
|---|---|
| Men | Women |
| G - good spouse | G - good spouse |
| Realistic (VPI) | Homemaking Competency |
| Acquiescence (VPI) | G - good parent |
| | Psycho-Sexual Status |
| | Finding Suitable Mate |
| **Low Means** | |
| Men | Women |
| Literary Potential | Literary Potential |
| Leadership Achievement | Leadership Achievement |
| Total Competencies | Artistic Potential |
| Arts Competency | Scientific Potential |
| Leadership & Sales Competency | Dramatic Arts Potential |
| SR - intellectual self-confidence | Range of Experience |
| SR - sensitivity to the needs of others | Government & Social Studies Competency |
| | Foreign Language Competency |
| | Academic Type |
| | Non-Conformist Type |
| | SR - leadership |
| | SR - popularity with opposite sex |
| | SR - physical energy |
| | G - authority on special subject in my field |

Table 11 (cont.)

Low Means

| Men | Women |
|---|---|
| | G - making parents proud<br>Size of High School Class |

Business and Administration (management, clerical, sales, finance, marketing, purchasing, economics, public relations, advertising, accounting, public administration, secretarial science, other business and commercial fields)

The men and women in this area have the following in common: They have conventional and enterprising interests. They want to be well-off financially, to be an expert in finance and commerce, and to have executive responsibility for the work of others. Compared with students in other fields, they are less intellectual, scientific, artistic, dramatic, and original.

In addition, the men are leaders and athletes, who see themselves as aggressive, independent, and practical-minded. They want to have the time and means to relax and enjoy life, they want to be mature and well-adjusted, and they want to be well-liked. On the other hand, they have many homemaking skills, they are not academic types, are less satisfied with their choice of college, and have rarely consulted with a professional person about their personal problems.

The women are competent on business and clerical skills, and on leadership and sales. They want to make their parents proud, to be religious, to be good parents, to avoid hard work, and to be successful

in their own business. They have few realistic or artistic interests and are less acquiescent than other students. Their interest and achievement in scientific, musical, or dramatic activities is low.

The data shown in Table 12 clearly depicts the people who plan to enter business and administrative positions. Generally, these findings are consonant with our conception of the businessman or the administrator. Possibly the sex differences occur because more women are planning for secretarial, clerical, or sales positions, while men are looking towards higher level positions in management, finance, and accounting.

Table 12

Student Characteristics associated with the Choice of Business and Administration

| High Means | |
|---|---|
| Men | Women |
| Conventional (VPI) | Conventional (VPI) |
| Enterprising (VPI) | Enterprising (VPI) |
| G - well-off financially | G - well-off financially |
| G - expert in finance and commerce | G - expert in finance and commerce |
| G - executive responsibility | G - executive responsibility |
| Aggressive (VPI) | Business and Clerical Competency |
| Leadership Achievement | Leadership and Sales Competency |
| Athletic Competency | G - making parents proud |
| Homemaking Competency | G - formal religious code |
| SR - aggressiveness | G - good parent |
| SR - independence | G - avoiding hard work |
| SR - practical-mindedness | G - successful in own business |
| G - relaxing and enjoying life | |
| G - mature and well-adjusted | |
| G - being well-liked | |

Table 12 (cont.)

Low Means

| Men | Women |
|---|---|
| Intellectual (VPI) | Intellectual (VPI) |
| Scientific Achievement | Scientific Achievement |
| Artistic Achievement | Artistic Achievement |
| Preconscious Activity | Preconscious Activity |
| SR - acting ability | SR - acting ability |
| | |
| Academic Type | Realistic (VPI) |
| SR - scholarship | Artistic (VPI) |
| G - helping others who are in difficulty | Acquiescence (VPI) |
| G - making sacrifices for others | Musical Potential |
| G - following formal religious code | Intellectual Home Resources |
| G - accomplished musician | Dramatic Arts Achievement |
| Satisfaction with College Choice | Arts Competency |
| Consultation with Professional Person | SR - drive to achieve |
| | SR - speaking ability |
| | SR - artistic ability |
| | SR - scientific ability |
| | SR - expressiveness |
| | SR - research ability |
| | G - accomplished in performing arts |
| | G - technical contribution to science |
| | G - being well-read |
| | G - real purpose in life |

Political Science (political science, law, foreign service)

Both men and women in this area are high on the goals of being influential in public affairs and keeping up-to-date politically. The men appear on only one other variable, being high on highest level of education.

The women, on the other hand, are aggressive, social, independent, and leaders. Their interpersonal relationships are good. They want to make their parents proud, to become community leaders, to find a real purpose in life, and to engage in exciting and stimulating activities. They are not musical, scientific, or homemakers.

Thus, a fairly good picture of the women planning this vocation emerges, but there is little evidence about the men.

Table 13

Student Characteristics associated with

the Choice of Political Science, Law, or Foreign Service

| High Means | |
|---|---|
| Men | Women |
| G - influential in public affairs<br>G - up-to-date politically | G - influential in public affairs<br>G - up-to-date politically |
| Highest Level of Education | Aggressive (VPI)<br>Status (VPI)<br>Leadership Potential<br>Leadership Achievement<br>Interpersonal Competency<br>SR - sociability<br>SR - aggressiveness<br>SR - independence<br>G - making parents proud<br>G - becoming a community leader<br>G - finding real purpose in life<br>G - engaging in exciting and stimulating activities |

| Low Means | |
|---|---|
| Men | Women |
| | Musical Achievement<br>Scientific Competency<br>Technical Competency<br>Homemaking Competency<br>G - inventing or developing a useful product or device<br>Psycho-Sexual Status |

Creative Arts (art, speech, music education, art education, drama, literature, English, creative writing, music, journalism, other fine and applied arts)

The men and women planning to enter the creative arts have more

variables in common than any other group. They are, for example, both high on literary, artistic, musical, and dramatic arts potential; literary, artistic, musical, and dramatic arts achievement; artistic, social and educational competency; and academic and collegiate type. They are original, expressive, cheerful, socially self-confident, feminine, and not conservative. They also have in common many goals and self-ratings, both high and low, that reinforce one's characterization of the kinds of people that would be in the creative arts vocations.

Furthermore, Table 14 indicates that these men and women are high or low on many other variables, in addition to those that are in common. Not only do men and women in creative arts have more variables in common than any other group, they are also either high or low on more variables than any other group. In addition, they usually obtain more high than low scores.

These results imply that people planning to enter this vocational area are individualistic, egotistical people who are not afraid of being extreme, people who do not want to be thought of as average or common.

Table 14

Student Characteristics associated with the Choice of Creative Arts

| High Means | |
|---|---|
| Men | Women |
| Literary Potential | Literary Potential |
| Artistic Potential | Artistic Potential |
| Musical Potential | Musical Potential |
| Dramatic Arts Potential | Dramatic Arts Potential |
| Dramatic Arts Achievement | Dramatic Arts Achievement |

Table 14 (cont.)

High Means

| Men | Women |
|---|---|
| Artistic Achievement | Artistic Achievement |
| Literary Achievement | Literary Achievement |
| Musical Achievement | Musical Achievement |
| Social & Educational Competency | Social & Educational Competency |
| Arts Competency | Arts Competency |
| Academic Type | Academic Type |
| Collegiate Type | Collegiate Type |
| SR - originality | SR - originality |
| SR - writing ability | SR - writing ability |
| SR - expressiveness | SR - expressiveness |
| SR - cheerfulness | SR - cheerfulness |
| SR - social self-confidence | SR - social self-confidence |
| SR - acting ability | SR - acting ability |
| G - accomplished performer | G - accomplished performer |
| G - writing good fiction | G - writing good fiction |
| G - being well-read | G - being well-read |
| G - awards or recognition | G - awards or recognition |
| G - good artistic work | G - good artistic work |
| G - accomplished musician | G - accomplished musician |
| G - good parent | G - good parent |
| G - finding real purpose in life | G - finding real purpose in life |
| | |
| Self-Control (VPI) | Artistic (VPI) |
| Leadership Potential | Intellectual Home Resources |
| Interpersonal Competency | Preconscious Activity |
| SR - sociability | Non-Conformist Type |
| SR - self-control | SR - leadership |
| SR - sense of humor | SR - popularity |
| G - happy and content | SR - artistic ability |
| G - meaningful philosophy | SR - speaking ability |
| G - formal religious code | SR - intellectual self-confidence |
| G - self-sufficient | SR - popularity with opposite sex |
| G - avoiding hard work | G - good spouse |
| G - exciting and stimulating activities | |
| Psycho-Sexual Status | |

Table 14 (cont.)

Low Means

| Men | Women |
|---|---|
| Masculine (VPI) | Masculine (VPI) |
| SR - mechanical ability | SR - mechanical ability |
| SR - conservatism | SR - conservatism |
| G - outstanding athlete | G - outstanding athlete |
| G - theoretical contribution to science | G - theoretical contribution to science |
| G - technical contribution to science | G - technical contribution to science |
| G - executive responsibility | G - executive responsibility |
| Satisfaction with College Choice | Satisfaction with College Choice |
| Conventional (VPI) | Aggressive (VPI) |
| Acquiescence (VPI) | Athletic Competency |
| Scientific Potential | Business and Clerical Competency |
| Scientific Competency | Dogmatism |
| Technical Competency | Vocational Type |
| SR - understanding of others | SR - scholarship |
| SR - mathematical ability | SR - aggressiveness |
| SR - scientific ability | SR - practical-mindedness |
| SR - research ability | SR - physical energy |
| G - influential in public affairs | G - sacrifices for others |
| G - mature and well-adjusted person | G - formal religious code |
| | G - good physical condition |
| Importance of Finding Suitable Mate | G - active in religious affairs |

Humanities (history, modern foreign language, philosophy, architecture, theology, religion, general humanities)

The men and women in this area are high on governmental, social studies, and language competencies, the goals of helping others, making sacrifices for others, and being active religiously. They are low on collegiate type, expected income, and on the goal of being well-off financially.

In addition, the men are artistic, original, scholarly, intellectually self-confident, popular with the opposite sex, and leaders. They have

few realistic interests and are not of the vocational type. They have little drive to achieve, are not practical-minded, have little sense of humor, their physical health is below average, and they are less dogmatic than other groups. They are not socially oriented, have less need for recognition, and do not mind hard work.

The women are self-controlled and conservative. They have few conventional interests and rate themselves low on originality and mathematical ability. The women do not appear as high or low on enough variables to make any reliable generalizations.

Table 15

Student Characteristics associated with the Choice of Humanities

| High Means | |
|---|---|
| Men | Women |
| Government and Social Studies Competency | Government and Social Studies Competency |
| Foreign Language Competency | Foreign Language Competency |
| G - helping others | G - helping others |
| G - sacrifices for others | G - sacrifices for others |
| G - active religiously | G - active religiously |
| Artistic (VPI) | Self-Control (VPI) |
| Business and Clerical Competency | SR - conservatism |
| Leadership and Sales Competency | Consultation with Professional Person |
| Preconscious Activity | |
| SR - leadership | |
| SR - understanding of others | |
| SR - scholarship | |
| SR - speaking ability | |
| SR - intellectual self-confidence | |
| SR - popularity with opposite sex | |
| SR - research ability | |

Table 15 (cont.)

Low Means

| Men | Women |
|---|---|
| Collegiate Type | Collegiate Type |
| Expected Income | Expected Income |
| G - well-off financially | G - well-off financially |
| Realistic (VPI) | Conventional (VPI) |
| Dogmatism | SR - originality |
| Vocational Type | SR - mathematical ability |
| SR - drive to achieve | |
| SR - practical-mindedness | |
| SR - sense of humor | |
| SR - physical health | |
| G - relaxing and enjoying life | |
| G - awards or recognition | |
| G - good physical condition | |
| G - good spouse | |
| G - avoiding hard work | |
| G - exciting activities | |

Military Science

The men in this vocational area appear on only one variable--that of being low on self-control.

Table 16

Student Characteristics associated with the Choice of Military Science

| High Means (Men) |
|---|
| (none) |
| **Low Means (Men)** |
| Self-Control (VPI) |

Individual Vocational Choice

Since many people will be more interested in the individual vocational choices (vocation by vocation) rather than in the data for groups

of vocational choices, Table 17 identifies the vocational choice that is highest and lowest on each of the 117 variables for both men and women. For example, on Realistic (variable 1, skilled and technical interests), industrial arts education is high for men and veterinary medicine is high for women; men in general humanities and women in management are low on this variable.

Table 17

The Vocational Choices with the Highest and Lowest Mean Scores on 117 Variables

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 1. Realistic | Ind. Arts Education | Gen. Humanities | Vet. Medic. | Management |
| 2. Intellectual | Bio-chem. | Sales | Bio-chem. | Sales |
| 3. Social | Counseling & Guidance | Metal. Engr'ng | Educ'l Psychology | Ag. Science |
| 4. Conventional | Accounting | Art Ed.; Anthro. | Accounting | Theology, Religion |
| 5. Enterprising | Marketing | Botany | Sales | Bio-chem. |
| 6. Artistic | Philosophy | Farming | Drama | Accounting |
| 7. Self-Control | Other Fine & Appl. Arts | Military Science | Theology, Religion | Vet. Medicine |
| 8. Aggressive | Public Admin. | Botany | Law | Other Fine & Applied Arts |
| 9. Masculine | Engr'ng, Gen. & Other | Art Educ. | Vet. Medic. | Art Educ. |
| 10. Status | Counseling & Guidance | Farming | Law | Ag. Science |
| 11. Acquiescence | Ind. Arts Education | Literature | Exp. & General Psych. | Management |
| 12. Leadership Potential | Speech | Botany | Political Science | Other Biol. Sciences |
| 13. Literary Potential | English, Creat. Wrtg | Trade & Indust'l Ed. | English, Creat. Wrtg | Business Education |
| 14. Artistic Potential | Art | Botany | Art Educ. | Business Education |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 15. Scientific Potential | Engr'ng Science | Art Educ. | Bio-chem. | Business Education |
| 16. Musical Potential | Music Education | Metall. Engr'ng | Music Education | Management |
| 17. Dramatic Arts Pot'l | Speech | Botany | English, Creat. Wrtg | Business Education |
| 18. Range of Experience | Exp. & General Psych. | Math. Educ. | Ag. Science | Business Education |
| 19. Intellectual Home Resources | Anthropology | Geography | Other Fine & Applied Arts | Accounting |
| 20. Scientific Achieve't | Astronomy, Astrophysics | Purchasing | Bio-chem. | Sales |
| 21. Leadership Achieve't | Public Admin. | Trade & Indust'l Ed. | Law | Library Science |
| 22. Dramatic Arts Ach. | Drama | Sociology | Drama | Accounting |
| 23. Artistic Achieve't | Art | Finance | Art Educ. | Accounting |
| 24. Literary Achieve't | English, Creat. Wrtg | Metall. Engr'ng | English, Creat. Wrtg | Dentistry |
| 25. Musical Achieve't | Music | Metall. Engr'ng | Music | Foreign Service |
| 26. Total Competencies | Other Health Fields | Trade & Indust'l Ed. | Educ'l Psychology | Other Biol. Sciences |
| 27. Scientific Competency | Zoology | Music Educ. | Zoology | Foreign Service |
| 28. Technical Comp. | Indust'l Engr'ng | Literature | Vet. Medic. | Foreign Service |
| 29. Gov't & Soc. St. Comp. | Philosophy | Metall. Engr'ng | History | Business Education |
| 30. Athletic Comp. | Public Admin. | Foreign Lang. Educ. | Vet. Medic. | Biology; Music Educ. |
| 31. Business & Clerical Comp. | Philosophy | Indust'l & Personnel Psychology | Public Relations | Art |
| 32. Social & Ed. Comp. | Drama | Botany | Drama | Chemistry |
| 33. Homemaking Comp. | Purchasing | Bio-chem. | Home Econ. Education | Foreign Service |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 34. Arts Comp. | Drama | Trade & Indust'l Ed. | Drama | Accounting |
| 35. Leadership & Sales Comp. | Philosophy | Trade & Indust'l Ed. | Public Relations | Ag. Science |
| 36. Foreign Lang. Comp. | Philosophy | Farming | Mod. Foreign Lang. | Business Education |
| 37. Preconscious Act. | Philosophy | Accounting | Drama | Accounting |
| 38. Dogmatism | Geography | Philosophy | Pharmacy | Literature |
| 39. Academic Type | Literature | Finance | Literature | Housewife |
| 40. Vocational Type | Metall. Engr'ng | General Humanities | Pharmacy | Literature |
| 41. Non-conf. Type | Philosophy | Theology, Religion | Literature | Home Econ. |
| 42. Collegiate Type | Speech | Philosophy | Speech | Theology, Religion |
| 43. Interpersonal Comp. | Drama | Physics | Law | Bio-chem. |
| 44. Expected Income | Medicine | Theology, Religion | Exp. & General Psych. | Theology, Religion |
| 45. Expected Vocational Achievem't | Philosophy | Sociology | Bio-chem. | Educ'l Psychology |
| 46. Highest Level of Education | Law | Indust'l Engr'ng | Clerical | Management |
| 47. SR - originality | English, Creat. Wrtg | Metall. Engr'ng | English, Creat. Wrtg | History |
| 48. SR - leadership | Philosophy | Astronomy, astrophysics | English, Creat. Wrtg | Library Science |
| 49. SR - mechanical ability | Mech'l Engr'ng | Literature | Vet. Medic. | Drama |
| 50. SR - popularity | Speech | Other Fine & Applied Arts | Speech | Library Science |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 51. SR - athletic ability | Phys. Ed., Recreation | Social Work | Phys. Ed., Recreation | Library Science |
| 52. SR - understanding of others | Philosophy | Other Fine & Applied Arts | Clinical Psychology | Other Biol. Sciences; Math Educ. |
| 53. SR - drive to achieve | Bio-chem. | General Humanities | Medicine | Public Relations |
| 54. SR - math ability | Math, Statistics | Literature | Math, Statistics | History |
| 55. SR - scholarship | Philosophy | Purchasing | Math., Statistics | Art |
| 56. SR - sociability | Speech | Botany | Foreign Service | Ag. Science |
| 57. SR - artistic ability | Art Educ. | Speech | Art | Accounting |
| 58. SR - aggressiveness | Marketing | Geography | Law | Other Fine & Applied Arts |
| 59. SR - speaking ability | Philosophy | Metall. Engr'ng | Drama | Accounting |
| 60. SR - self-control | Literature | Botany | Pharmacy | Exp. & General Psych. |
| 61. SR - independence | Economics | Sociology | Law | Library Science |
| 62. SR - scientific ability | Physics | Speech | Bio-chem. | Sales |
| 63. SR - conservatism | Physiology | Other Fine & Applied Arts | Theology, Religion | Other Fine & Applied Arts |
| 64. SR - practical-mindedness | Public Admin. | General Humanities | Pharmacy | Drama |
| 65. SR - writing ability | English, Creat. Wrtg | Geography | English, Creat. Wrtg | Other Biol. Sciences |
| 66. SR - expressiveness | English, Creat. Wrtg | Botany | English, Creat. Wrtg | Accounting |
| 67. SR - cheerfulness | Speech | Astronomy, Astrophysics | Speech | Other Biol. Sciences |
| 68. SR - social self-confidence | Speech | Botany | English, Creat. Wrtg | Ag. Science |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 69. SR - intellectual self-confidence | Philosophy | Indus'l Arts Educ. | English, Creat. Wrtg | Pharmacy |
| 70. SR - perseverance | Exp. & General Psych. | Geography | Medicine | Pharmacy |
| 71. SR - popularity with opposite sex | Philosophy | Bio-chem. | English, Creat. Wrtg | Ag. Science; Educ., general & other; Library Science |
| 72. SR - research ability | Philosophy | Speech | Zoology | Accounting |
| 73. SR - physical energy | Phys. Ed., Recreation | Social Work | Phys. Ed., Recreation | Library Sci.; Other Fine & Appl. Arts |
| 74. SR - sense of humor | Drama | General Humanities | Exp. & General Psych. | Pharmacy |
| 75. SR - physical health | Other Fine & Applied Arts | General Humanities | Zoology | Educ'l Psychology |
| 76. SR - acting ability | Drama | Purchasing | Drama | Accounting |
| 77. SR - sensitivity to needs of others | Clinical Psychology | Trade & Indust'l Education | Zoology; Counseling & Guidance | Bio-chem. |
| 78. G - happy and content | Speech | Foreign Lang. Educ. | Zoology | Bio-chem. |
| 79. G - well-off financially | Public Relations | Theology, Religion | Public Relations | Theology, Religion |
| 80. G - inventing useful product | Physics | English Education | Zoology | Poli. Sci.; Foreign Service |
| 81. G - helping others | Theology, Religion | Astronomy, Astrophysics; Economics | Theology, Religion | Vet. Med. |
| 82. G - accomplished performer | Drama | Metall. Engr'ng | Drama | Accounting |
| 83. G - meaningful philosophy of life | Literature | Foreign Language Education | English, Creative Writing | Speech |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 84. G - authority on special subject in field | Geology | Sociology | Zoology | Housewife |
| 85. G - making parents proud | Geography | Anthropology | Zoology; Purchasing; Law | Library Science |
| 86. G - outstanding athlete | Phys. Ed., Recreation | Music Educ. | Phys. Ed., Recreation | Literature |
| 87. G - sacrifices for others | Theology, Religion | Economics | Theology, Religion | Literature |
| 88. G - community leader | Speech | Literature | Political Science | Bio-chem. |
| 89. G - influential in public affairs | Political Science | Astronomy, Astrophysics; Literature | Political Science | Bio-chem. |
| 90. G - formal religious code | Speech | Astronomy, Astrophysics; Economics | Public Relations | English, Creat. Wrtg |
| 91. G - relaxing & enjoy life | Public Admin. | Theology, Religion | Zoology | Bio-chem. |
| 92. G - theoretical contrib. to science | Bio-chem. | Literature | Bio-chem. | Drama |
| 93. G - technical con tribution to science | Bio-chem. | Literature | Bio-chem. | Sales; Drama |
| 94. G - writing good fiction | English, Creat. Wrtg | Metall. Engr'ng | English, Creat. Wrtg | Dentistry |
| 95. G - being well-read | Literature | Other Health Fields | Literature | Accounting |
| 96. G - mature & well-adjusted | Public Admin. | Drama | Zoology | Agricultural Science |
| 97. G - awards or recognition | Music | Theology, Religion | Drama | Other Health Fields |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 98. G - self-sufficient | Literature | Botany | Chemistry | Ag. Science |
| 99. G - good physical condition | Geography | Philosophy | Phys. Ed., Recreation | Literature |
| 100. G - good art. work | Art Educ. | Math Educ. | Art Educ. | Veterinary Medicine |
| 101. G - accomplished musician | Music | Metall. Engr'ng; Economics | Music | Educ'l Psychology |
| 102. G - expert in finance & comm. | Finance | Zoology | Accounting | Zoology; Biology |
| 103. G - up-to-date politically | Political Science | Other Health Fields | Political Science | Bio-chem. |
| 104. G - being well-liked | Public Admin. | Anthropology | Zoology | Exp. & General Psych. |
| 105. G - good spouse | Indust'l Arts Educ. | General Humanities | Other Fine & Applied Arts; Library Sci.; Zoology; Sociology | Exp. & General Psych. |
| 106. G - good parent | Speech | Astronomy, Astrophysics | Zoology; Sociology; Accounting; Other Fine & Applied Arts; Lib. Science | Exp. & General Psych. |
| 107. G - real purpose in life | Literature | Astronomy, Astrophysics | Zoology; Music; Law | Management |
| 108. G - active religiously | Theology, Religion | Anthropology | Theology, Religion | Literature |
| 109. G - executive responsibility | Public Admin. | Literature | Management | Drama |
| 110. G - avoiding hard work | Speech | Bio-chem.; Philosophy | Public Relations | Zoology |
| 111. G - exciting activities | Speech | Farming; Theology, Religion | Foreign Service | Pharmacy |

Table 17 (cont.)

| Variable | Men | | Women | |
|---|---|---|---|---|
| | Highest | Lowest | Highest | Lowest |
| 112. G - success in own business | Dentistry | Anthropology | Sales | Bio-chem. |
| 113. Psycho-sexual status | Literature | Geography | Housewife | Political Science |
| 114. Satisfaction with College | Veterinary Medicine | Drama; Public Rel. | Ag. Science | Art |
| 115. Consultation with Prof'l Person | Other Health Fields | Economics | Theology, Religion | Math, Statistics |
| 116. Finding Suitable Mate | Astronomy, Astrophysics | Speech | Housewife | Other Biol. Sciences |
| 117. Size of High School Class | Indust'l & Personnel Psychology | Farming | Exp. & General Psych. | Home Econ. Education |

Even a cursory review of Table 17 makes clear the finding that our vocational stereotypes have some validity. For example, on scientific achievement (variable 20), men in astronomy and astrophysics and women in biochemistry are high, and men in purchasing and women in sales are low. On the goal of having executive responsibility for the work of others (variable 109), men in public administration and women in management are high, and men in literature and women in drama are low.

## Variation Among Vocational Choices

The student characteristics which distinguish most efficiently one vocational choice from another are important for the reasons that such knowledge reduces the number of student characteristics which we need to use in subsequent studies and identifies the descriptive variables which have the most practical value.

We determined those variables which had the greatest variation across the 76 male and 58 female vocational choices that had an N of at least 10. This variation was the range of vocational choice means divided by the standard deviation for the total population for each sex. Generally, those variables with the greatest variation across vocations were retained for a simple analysis of variance. Other variables, however, were added so that every kind of variable would be sampled. For example, several self-ratings, life goals, and achievement scales were tested for significance, although they were not among the variables showing the greatest variation.

Table 18 presents the results of these simple analyses of variance. Of the 53 variables studied, all but one are significant at the .01 level for both sexes and the last (G - self-sufficient) is significant at the .05 level for the male sample, but not the female.

Table 18

F-Tests for Selected Student Characteristics

Across Vocations

| Variable | Men | Women |
|---|---|---|
| 1. Realistic | 8.6152 | 3.3414 |
| 2. Intellectual | 15.0993 | 13.5548 |
| 3. Social | 17.2490 | 10.6901 |
| 4. Conventional | 20.9484 | 13.9858 |
| 5. Enterprising | 15.2306 | 3.8965 |
| 6. Artistic | 13.6045 | 7.9783 |
| 9. Masculine | 15.3704 | 14.9835 |
| 10. Status | 16.7917 | 6.0887 |
| 15. Scientific Potential | 20.2207 | 10.6435 |
| 16. Musical Potential | 15.0296 | 6.3862 |

Table 18 (cont.)

| Variable | Men | Women |
|---|---|---|
| 20. Scientific Achievement | 6.9093 | 4.8959 |
| 21. Leadership Achievement | 4.3493 | 2.9920 |
| 22. Dramatic Arts Achievement | 5.1641 | 4.9564 |
| 23. Artistic Achievement | 8.0012 | 15.5274 |
| 24. Literary Achievement | 6.1372 | 8.5481 |
| 25. Musical Achievement | 9.6659 | 7.2936 |
| 27. Scientific Competency | 8.3534 | 9.4846 |
| 34. Arts Competency | 8.8928 | 7.0871 |
| 35. Leadership & Sales Competency | 5.4688 | 3.0564 |
| 36. Foreign Language Competency | 6.0705 | 10.3257 |
| 37. Preconscious Activity | 14.4343 | 11.9957 |
| 40. Vocational Type | 5.9436 | 6.6956 |
| 41. Non-Conformist Type | 3.2916 | 4.4867 |
| 44. Expected Income | 16.1769 | 8.4112 |
| 46. Highest Level of Education | 19.1990 | 11.0295 |
| 47. SR - originality | 5.7809 | 7.7054 |
| 49. SR - mechanical ability | 10.3847 | 4.3726 |
| 50. SR - popularity | 3.2677 | 1.5627 |
| 51. SR - athletic ability | 5.8798 | 8.6726 |
| 52. SR - understanding of others | 3.1559 | 2.8306 |
| 54. SR - mathematical ability | 18.8744 | 13.8174 |
| 57. SR - artistic ability | 10.3715 | 14.8308 |
| 59. SR - speaking ability | 6.6427 | 4.2949 |
| 60. SR - self-control | 1.8272 | 1.6981 |
| 62. SR - scientific ability | 22.8717 | 21.0032 |
| 63. SR - conservatism | 1.7337 | 1.7500 |
| 65. SR - writing ability | 6.5944 | 12.1985 |
| 72. SR - research ability | 8.0025 | 6.4561 |
| 76. SR - acting ability | 5.1694 | 4.7334 |
| 79. G - well-off financially | 4.8257 | 2.3281 |
| 82. G - accomplished in performing arts | 10.6115 | 11.7265 |
| 86. G - outstanding athlete | 8.3338 | 12.6616 |
| 89. G - influential in public affairs | 6.3362 | 3.8652 |
| 92. G - theoretical contribution to science | 19.3678 | 14.8060 |
| 94. G - writing good fiction | 10.3311 | 15.8997 |
| 98. G - self-sufficient | 1.3683 | 1.2451 |
| 99. G - good physical condition | 2.4971 | 2.4305 |
| 100. G - good artistic work | 14.9475 | 20.8573 |

Table 18 (cont.)

| Variable | Men | Women |
|---|---|---|
| 101. G - accomplished musician | 14.1473 | 16.7881 |
| 102. G - expert in finance and commerce | 23.8636 | 7.5228 |
| 103. G - up-to-date politically | 8.3265 | 4.0923 |
| 105. G - good spouse | 1.7575 | 1.9383 |
| 108. G - active in religious affairs | 4.9646 | 5.2307 |

Degrees of freedom
male: 76/5554
female: 58/5570

Significance levels
male: .05 = 1.28; .01 = 1.41
female: .05 = 1.32; .01 = 1.47

The results in Table 18 indicate that vocational interest variables consistently show the greatest variation among student vocational choices. Self-ratings and life goals show equally large variation, but such variables differentiate vocational choices less consistently.

## Discussion

Several cautions should be observed in the interpretation of the results: Our students are aspirants for various vocations, they are not employed in occupations. The number of students with a given vocational choice varied from 10 to 1497, so that some characteristics are more reliable than others. Finally, the use of the highest and lowest mean scores of the descriptive variables accentuates the characterization of students in various fields. Every field probably contains many students who differ from the typical student.

The descriptions of students seeking different vocations imply, to a limited degree, that students know where they belong. They seek

vocations which are appropriate for their interests, values, and their special talents. Students with scientific accomplishments, abilities, and interests seek scientific vocations, and at the same time they avoid vocations which demand interpersonal competencies. Similar patterns of attraction and avoidance exist for most of the remaining areas of study.

These results also reveal that vocational decisions depend upon a great range of student characteristics: interests, values, self-conceptions, competencies, achievements, range of experience, and family resources. Therefore, students might be helped to choose a vocation by broad self-examination.

Since large proportions of students who say they plan to enter a vocation do enter that vocation, the present results may have some practical value (Strong, 1953). The descriptive variables are easily interpreted and are relatively free of psychological jargon. Perhaps just reading the present report would be helpful to some students. If such simple techniques were constructive, they could serve many students who cannot make use of guidance workers either because they dislike the idea itself, or because counseling staffs are too small to serve all students. Faculty advisors should also find a reading of the present report helpful in their advising.

The similarities between the present descriptive study of students who have selected a given vocation and the study of students who have selected a comparable field of study (Abe & Holland, 1965) are quite striking. The descriptions of prospective physical science majors and

of prospective physical scientists are almost identical (compare Table 4 in this study with Table 4 in the earlier study). Some readers will find it interesting to compare tables throughout both studies. Even the variation in descriptive variables is comparable in both studies (compare Table 18 in this study with Table 18 in the earlier study). Although we cannot say that the choice of major field is identical with the choice of vocation, our results strongly suggest a close association.

Generally, the descriptions of students seeking different vocations are consistent with related studies by Cooley (1963), Darley and Hagenah (1955), Davis (1964), Holland (1963), Roe (1956), and others. Since most studies do not group students in identical fashion, precise correspondence among studies is rare.

In new studies, we plan to develop psychological classification schemes which will be useful for practice and research. The current conventional classifications lack psychological homogeneity so that membership in a group frequently has diffuse and even conflicting meaning. Other studies will be performed to learn how students who persist in a field differ from students who leave a field. In these long term studies we will be able to determine the predictive validities of the assessment devices used in this first study as well as the influence of various college climates upon a student's choice of vocation.

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