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A STUDY OF SUCCESSFUL AND UNSUCCESSFUL FRESHMAN PHARMACY STUDENTS AS RELATED TO THEIR OCCUPATIONAL GROUP SCORES ON THE STRONG VOCATIONAL INTEREST BLANK

by
Richard Henry Howland

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in the
University of Michigan
1964

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CHAPTER I

PURPOSES OF THE STUDY

The primary purpose of this study is to determine if there are differences among four pharmacy groups as measured by their occupational group scores on the Strong Vocational Interest Blank.[1,2] For the past five years, the drop-out rate in the pharmacy program at Ferris Institute has been approximately 40 per cent during the first year and an additional 20 per cent in the second year.[3] Comparable drop-out rates ranging from 40 to 60 per cent are also reported by the Committee on Predictive and Achievement Tests of the American Association of Colleges of Pharmacy.[4]

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[1] Pharmacy Group 1 is composed of those pharmacy students with a grade point average of 2.00 or above who are continuing the study of pharmacy. Pharmacy Group 2 is composed of those pharmacy students with a grade point average of 2.00 or above who have discontinued the study of pharmacy. Pharmacy Group 3 is composed of those pharmacy students with a grade point average below 2.00 who are continuing the study of pharmacy. Pharmacy Group 4 is composed of those pharmacy students with a grade point average below 2.00 who have discontinued the study of pharmacy. These four different pharmacy groups are defined and discussed in further detail on page 28.

[2] The term Strong Vocational Interest Blank will hereinafter be abbreviated as SVIB.

[3] These per cent figures were obtained from Dr. Edward Claus, Dean of the School of Pharmacy, and Mr. Clark Andreson, Assistant Dean of the School of Pharmacy.

[4] Edward A. Brecht, "Report of the Committee on Predictive and Achievement Tests," American Journal of Pharmaceutical Education, XIX, (1955), 159.

Inasmuch as this drop-out rate is a problem at Ferris Institute, as well as at other colleges and universities, it was believed that a study of the occupational groups within the SVIB might aid in identifying those students who are likely to succeed or fail during their first two years in the pharmacy program.

The second purpose of this study is to determine if the SVIB Occupational Groups VIII-A and VIII-B as two separate groups are better able to show differences among the pharmacy groups than the SVIB Occupational Group VIII which combines these two groups.[1] On the basis of the experiences of the members of the counseling staff at Ferris Institute, the mortician and pharmacist keys tend to emerge as a separate group within the SVIB Occupational Group VIII.[2] If differences exist among the pharmacy groups by using the SVIB Occupational Group VIII as two separate groups, such information might be helpful in analyzing and interpreting student scores on the SVIB.

The third purpose of this study is to determine if there is a difference between pharmacy students with a cumulative grade point average above 2.00 and pharmacy

---

[1]The SVIB Occupational Group VIII is composed of the following seven keys: Senior C.P.A., Accountant, Office Man, Purchasing Agent, Banker, Mortician, and Pharmacist. The SVIB Occupational Group VIII-A is composed of the first five of these latter keys, and the SVIB Occupational VIII-B is composed of the Mortician and Pharmacist keys.

[2]Interview with Dr. Donald L. Hecker, Director of the Counseling Staff, Ferris Institute, Big Rapids, Michigan, July 19, 1962.

students with a cumulative grade point average below 2.00 (Pharmacy Groups 1+2 vs. Pharmacy Groups 3+4) as measured by their SVIB occupational group scores. Further knowledge about possible differences between these scores might aid in identifying those male pharmacy students who are likely to succeed or fail in the pharmacy program.

The fourth purpose of this study is to determine if there is a difference between students who continue the study of pharmacy and students who discontinue the study of pharmacy (Pharmacy Groups 1 + 3 vs. Pharmacy Groups 2 + 4) as measured by their occupational group scores on the SVIB. Further knowledge about possible differences in these scores might aid in identifying those male pharmacy students who are likely to continue or discontinue the study of pharmacy.

The fifth purpose of this study is to determine if there is a difference between the students in Pharmacy Group 1 and the students in Pharmacy Group 2 as measured by the mean cumulative grade point average for each group. Further knowledge about possible differences in academic achievement might aid in identifying those male pharmacy students with a grade point average above 2.00 who are likely to continue or discontinue the study of pharmacy.

The sixth purpose of this study is to determine if there is a difference between the students in pharmacy Group 3 and the students in Pharmacy Group 4 as measured by the mean cumulative grade point average for each group. Further knowledge about possible differences in academic achievement might aid

in identifying those male pharmacy students with a grade point average below 2.00 who are likely to continue or discontinue the study of pharmacy.

The seventh purpose of this study is to determine if pharmacy students earn a greater proportion of "D" and "E" grades in the PSM courses than they earn in the Non-PSM courses.[1] Further knowledge about those courses which contribute more heavily to academic failure might aid in identifying those male pharmacy students who are likely to succeed or fail in the pharmacy program.

---

[1]The abbreviation PSM courses means Pharmacy-Science-Mathematics courses, and the abbreviation Non-PSM courses means the Non-Pharmacy-Science-Mathematics courses.

CHAPTER II

REVIEW OF RELATED LITERATURE

A review of the literature reveals that there are many research studies dealing with the prediction of academic success of students in medicine, dentistry, veterinary science, psychology, nursing, engineering, law, teaching, and other professional occupations. The number of predictive studies conducted in the area of pharmacy, however, is very limited. Remmers and Gage state:

> Personnel techniques available well before World War II and, of course, greatly developed during the war, have been extensively applied in other educational, industrial, and military areas. They have been applied, however, only sporadically and institutionwise in pharmacy--at least if the paucity of published technical literature is any indication.[1]

Super also refers to the limited research in selecting pharmacy students. In his discussion on custom-built batteries for specific occupations, he states:

> Until recently little attention was paid to the scientific selection of students of pharmacy, and little was known concerning psychological factors related to success of this occupation. During World War II, however, members of the occupation became more self-conscious as a profession, even to the point of changing the status of pharmacists in the Army from enlisted to commissioned grade. Since the War, the American

---

[1] H. H. Remmers and N. L. Gage, "Achievement and Predictive Testing in the Pharmaceutical Survey, Purdue University," American Journal of Pharmaceutical Education, XI (1947), 43-44.

> Pharmaceutical Association has been engaged in co-operative study with the American Council on Education, one of the purposes of which is to develop better methods of selecting pharmacists.[1]

A review of the literature also reveals that most of the research dealing with the prediction of academic success of pharmacy students has been based on achievement, aptitude, and intelligence tests rather than interest tests. The research studies conducted by Moore,[2] Ralph,[3] Jex,[4] and Kelly,[5] are examples of this common practice. Not a single study was found which specifically used the scores obtained by pharmacy students on the SVIB as a predictor of academic success in the pharmacy program. The few studies that do relate academic success of pharmacy students to interest have generally been based on the Kuder Preference Record

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[1]Donald E. Super, Appraising Vocational Fitness by Means of Psychological Tests (New York: Harper and Brothers, 1949), p. 347.

[2]Marjorie E. Moore, "The Evaluation of Certain Factors for Predicting the Success of Students Entering the College of Pharmacy of the University of Minnesota from 1933 through 1943," Journal of Experimental Education (March, 1946), 207-24.

[3]Sally Ralph, "Prediction of Success in the College of Pharmacy at the University of Utah," (Unpublished Master's thesis, University of Utah, 1948).

[4]Frank B. Jex, "Predicting Scholastic Achievement at the University of Utah," (Unpublished Ph.D. dissertation, University of Utah, 1949).

[5]William F. Kelly, "Predicting Academic Success in the College of Pharmacy at the University of Kentucky," (Unpublished Master's thesis, University of Kentucky, 1954).

rather than the Strong Vocational Interest Blank.[1]

McDaniel and Stephenson state that achievement, aptitude, and intelligence tests are used more extensively in predicting academic success because they have usually given better predictions than tests designed to measure interest and personality.[2]

Remmers and Gage obtained similar results in their study on the abilities and interests of pharmacy freshmen, and state that, ". . . the mathematics, physical science, and English tests are more generally suitable for predicting first semester grades in colleges of pharmacy."[3] Studies reviewed by Darley and Hagenah and Strong have also led to the conclusion that interest tests have a very low relationship to achievement in high school or college.[4,5]

Super states, however, that these conclusions are not completely valid because, "The size of the relationship

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[1] H. H. Remmers and N. L. Gage, The Abilities and Interests of Pharmacy Freshmen, Monograph No. 1 (Washington, D. C.: American Council on Education, 1946), pp. 12-13.

[2] Ernest D. McDaniel and Howard W. Stephenson, "Prediction of Scholastic Achievement in Pharmacy at the University of Kentucky," American Journal of Pharmaceutical Education, XXIV (1960), 162.

[3] H. H. Remmers and N. L. Gage, "The Abilities and Interests of Pharmacy Freshmen," American Journal of Pharmaceutical Education, XII, (1948), 63.

[4] John G. Darley and Theda Hagenah, Vocational Interest Measurement (University of Minnesota, 1955), p. 275.

[5] Edward K. Strong Jr., Vocational Interests of Men and Women (Stanford University, 1943), p. 746.

depends on the ranges of interest and ability in the persons in the sample, and on the conditions under which the students study."[1] He also emphasizes the importance of interest tests in predicting academic achievement and infers that they will play a greater role in future predictive research. He says:

> Imperfect prediction of success by use of aptitude tests has resulted in the centering of attention on the part that interest plays in success. The hypothesis has been that interest serves as a determinant of the use of ability and provides the motivating force directing intelligence. The great expectations attending the development of interest measures were at first not realized. More recent developments suggest that interest does indeed play a part in achievement even though not in as direct a way as had been expected.[2]

Berdie also emphasizes the value of vocational interest tests by referring to the results of a battery of aptitude, achievement, interest, and personality tests administered to 1500 freshmen at the University of Minnesota in 1939. He states the following:

> The results leave little question that vocational interest tests differentiate better among curricular groups than do other kinds of tests and that the prediction of which curriculum a student will graduate from can be better made with an interest test than with either aptitude tests or achievement tests.
>
> For those training programs which are at the college levels, differential abilities do not appear to be very important when compared to differential interests. The evidence suggests that abilities cannot be disregarded, and that both tests of abilities and achievement can make real contributions to the college counselling program, but these results

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[1] Donald E. Super, "Interest Tests," Encyclopedia of Educational Research, Third Edition (New York: The Macmillan Company, 1960), p. 731.

[2] Ibid, p. 731.

> even more emphatically delineate the need for interest measurement in counselling. Differential educational and vocational distribution at the college level, as shown by attainment of college degrees, is much more dependent upon motivations and interests than upon special abilities.[1]

One of the earliest studies dealing with the traits necessary for becoming a pharmacist was conducted by Charters, Lemon, and Monell in 1927. Table 1 shows the comparative rankings of the thirty-three personal traits which these authors outlined. On the basis of their findings and other practical considerations, the authors condensed the original thirty-three traits as outlined in Table 1 into a self-analysis inventory of eighteen traits. This chart or inventory then contained the following items: ability to gain confidence, administrative ability, accuracy, cheerfulness, courtesy, dependability, desire to serve, fairness, forcefulness, good taste, health, honesty, interest in community, kindliness, perseverance, professional interest, professional skill, and self-respect.

This early attempt to analyze the traits necessary for becoming a pharmacist was a valuable study. The traits cited by these authors, however, are altogether too general. They are also common to almost any professional occupation. Their findings, therefore, are of limited value in terms of accurately differentiating the specific traits or interests necessary for becoming a pharmacist apart from the traits or

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[1]R. F. Berdie, "Aptitude, Achievement, Interest, and Personality Tests: A Longitudinal Comparison," Journal of Applied Psychology, XXXIX (1955), 103-14.

TABLE 1

Ranking of Vocational Traits of Pharmacists Based on Judgments of Pharmacists, Instructors, and Customers[1,2]

Traits	Total of all grps.	Pharmacists	Instructors	Customers
Accuracy	1	1	1	3
Honesty	2	4	1	5
Dependability	3	3	6	3
Professional technique	4	5	3	2
Cleanliness	5	7	4	1
Ability to gain confidence	6	1	8	7
Service	7	5	6	6
Intelligence	8	9	4	7
Courtesy	9	9	18	9
Judgment	9	15	10	10
Professional interest	11	12	13	12
Orderliness	12	9	16	13
Self-respect	12	12	8	19
Industry	14	17	16	13
Neatness	15	19	13	15
Self-control	16	12	16	19
Fairness	17	14	11	22
Health	17	15	18	16
Concentration	19	24	13	11
Administrative ability	20	17	22	19
Cheerfulness	21	21	20	22
Memory	22	26	25	17
Resourcefulness	23	19	20	27
Tact	24	21	25	24
Self-confidence	25	23	23	26
Perseverance	26	28	25	21
Cooperativeness	27	27	28	28
Adaptability	28	24	30	31
Kindliness	29	29	29	29
Interest in community	30	31	25	29
Speed	31	30	32	25
Forcefulness	32	32	31	33
Artistic taste	33	33	32	32

[1]Table 1 should be read as follows: Accuracy was given first place by all the judges combined; the pharmacists gave it first rank; the instructors also gave it first rank; and the customers assigned it a third position.

[2]W. W. Charters, A. B. Lemon, and Leon Monell, Basic Material for a Pharmaceutical Curriculum (New York: McGraw-Hill Book Company, Inc., 1927), p. 106.

interests necessary for other professional occupations.

In their first monograph dealing with abilities and interests of pharmacy freshmen, Remmers and Gage reported the results of an investigation of the differences in scholastic ability and achievement between pharmacy freshmen and freshmen from other schools within the same university.[1] Ten institutions were surveyed, and the data revealed that pharmacy freshmen were generally inferior to arts and science and engineering freshmen, and generally superior to agriculture and home economics freshmen as measured by their performance on scholastic ability and achievement tests. With reference to the preference patterns of pharmacy freshmen, it was found that they are sharply distinguishable from those of high school pupils and adults in general, but they correspond closely with those of advanced women students in pharmacy and with those of male drug store managers and pharmacists. There was also some evidence which showed that male pharmacy freshmen lack the high scores on the Persuasive Scale of the Kuder Preference Record that characterized adult drug store managers and pharmacists. Later in their third monograph, Remmers and Gage reported that the Pharmacy Background Test and the Kuder Preference Record appeared to

---

[1] H. H. Remmers and N. L. Gage, The Abilities and Interests of Pharmacy Freshmen, Monograph No. 1 (Washington, D. C.: American Council on Education, 1946), pp. 12-13.

be of no value in predicting withdrawal from the pharmacy program.[1]

In 1946 an extensive, nationwide study on the abilities, interests, personality characteristics, and other related factors necessary for success in a pharmacy program was undertaken by Dr. H. H. Remmers, who was assisted by Dr. N. L. Gage and A. J. Drucker of Purdue University. This pharmaceutical survey was the first of its kind and served as a model for subsequent pharmacy prediction research undertaken by other colleges and universities throughout the United States.[2,3,4] On the basis of the final validation study of 1951, these authors formulated the following conclusions:

> 1. The battery of tests administered to entering freshmen is substantially predictive of scores on the Senior Comprehensive Examination four years later.
>
> 2. There is some indication that within a single institution, the prediction battery may successfully predict to some extent the grades (over-all, pharmaceutical only, non-pharmaceutical only, and senior grades) of students completing the program. It is not possible to provide, however, a national formula for the prediction of such grades, for grading systems from institution to institution, even when they appear to be comparable are, in fact, not comparable.

---

[1] H. H. Remmers and N. L. Gage, Student Personnel Studies, Monograph No. 3 (Washington, D. C.: American Council on Education, 1949).

[2] Remmers and Gage, American Journal of Pharmaceutical Education, XII (1948), 5.

[3] Remmers and Gage, American Journal of Pharmaceutical Education, XIII (1949), 6.

[4] Remmers and A. J. Drucker, American Journal of Pharmaceutical Education, XV (1951), 149.

3. There is some indication that the predictive battery does a better job of predicting non-pharmaceutical than pharmaceutical grades.

4. For many institutions participating in the study, the amount of relationship existing between scores on the Senior Comprehensive Examinations and grades given in corresponding courses is substantial, indicating that grades and the examinations are not mutually exclusive indices of success in pharmaceutical training.

5. The battery of predictive tests used in this and previous studies of The Pharmaceutical Survey, are of value in predicting which students will survive the four-year training period in some institutions and of negligible value in other institutions. The Purdue Mathematics Training Test and the Purdue Physical Science Test have been most successful in predicting survival in pharmacy both after two and after four years of training.[1]

An important study with reference to job satisfaction as related to interest in pharmacy was conducted by Milton Schwebel at Columbia University in 1951. In this study he attempted to answer the following four questions:

1. By excluding the dissatisfied members of an occupation, can an interest scale be developed which will differentiate the satisfied from the dissatisfied in this occupation?

2. Will the dissatisfied members of an occupation serve as a better point of reference than a group of men-in-general in constructing an interest scale for the differentiation of the satisfied?

3. Do the interests of pharmacists form a pattern distinguishable from those of other occupations?

4. Can the pharmacists who devote less than 25 per cent of their time to prescription work or research be differentiated by their interests from the apothecary pharmacists who devote more than 25 per cent of their time to the scientific activities of the profession?[2]

---

[1] Remmers and Drucker, American Journal of Pharmaceutical Education, XV (1951), 149.

[2] Milton Schwebel, The Interests of Pharmacists (New York: King's Crown Press, Columbia University, 1951), p.66.

His study included 450 pharmacists and the findings of his investigation may be summarized as follows:

1. Members of the pharmacy profession have a recognizable pattern of likes and dislikes.

2. Pharmacists have been successfully differentiated from other occupational groups on two new pharmacy scales of the Strong Vocational Interest Blank, one of which (Pharmacy Scale) employed Strong's men-in-general group as point of reference, and the other (S-D Scale),[1] a group of dissatisfied pharmacists. In construction of both scales the criterion groups were satisfied pharmacists.

3. A vocational interest scale (S-D Scale) of the Strong Vocational Interest Blank has been developed which differentiates groups of satisfied and dissatisfied pharmacists with moderate success.

4. The exclusion of the dissatisfied pharmacists from the weight group was not sufficient to accomplish this, for the Pharmacy Scale did not differentiate the two successfully. The S-D and Pharmacy Scales differ only in respect to the point of reference. To this alone, therefore, must the variance in the differentiating ability of the two scales be attributed.

5. Both scales in which the criterion groups were limited to satisfied pharmacists were significantly correlated with the feeling of satisfaction.

6. There is some evidence of a difference in the interests of apothecary and business pharmacists, but these differences were not sufficiently great to be converted into a differentiating scale (A-B Scale)[2] by the methods used.

7. The reliability coefficients, lower than the average for all of Strong's scales, are sufficiently high to justify use of the keys at least for group comparisons. The greater homogeneity and smaller size of the groups used to determine reliability in this study probably account for the lower coefficients. The smallness of the point of reference group of the S-D Scale (111 dissatisfied pharmacists) is a possible cause for the implied instability of weights.

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[1]The abbreviation "S-D Scale" as used by Schwebel means the Satisfied versus Dissatisfied Pharmacists Scale.

[2]The abbreviation "A-B Scale" as used by Schwebel means the Apothecary versus Business Pharmacists Scale.

8. Interrelationship of scores of pharmacists on the pharmacy and non-pharmacy scales suggests that the typical pharmacist, as well as the typical satisfied pharmacist, has interests similar to those of the businessman.[1]

A pilot test study designed to measure twenty-six different motivations of students enrolled in professional schools of the health sciences (dentistry, medicine, nursing, pharmacy, and public health) was conducted over a three-year period from 1951-52 to 1953-54 at the University of California. The number of students participating in this study was 1,569; and of this number, pharmacy students comprised 28.2 per cent of the total. Many interpretations can be drawn from this study, and Pratt, in his detailed analysis, points out that pharmacy students give greater emphasis to financial aspects in all items which have a monetary consideration. He states that:

> . . . compared with the pooled responses of all students surveyed, the pharmacy students' replies indicate a greater interest in the material aspects of their profession. . . . The data suggest that pharmacy students, regardless of age, may be motivated by "practical" considerations to a greater extent than students in some of the other professional areas. Examples of such considerations are expectation of economic security; expectation of advancement in position and social prestige; an existing setup, such as a partnership; and an opportunity to fulfill one's financial needs immediately.[2]

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[1] Milton Schwebel, The Interests of Pharmacists (New York: King's Crown Press, Columbia University, 1951) p. 68.

[2] Robertson Pratt, "Analysis of a Pilot Study of Factors that Motivate Individuals to Elect the Health Sciences as a Career with Special Reference to Pharmacy," American Journal of Pharmaceutical Education, XX (1956), 189-90.

Pharmacy students are required to take several courses in chemistry, and the success or failure of the student in his chemistry courses often determines whether he will succeed or fail in the pharmacy program. A study on the prediction of general chemistry grades for five freshmen classes composed of 595 college students for the years 1955 and 1956 was conducted by the College of Pharmacy at the University of Illinois.[1] In this study, the general chemistry grade point average of those who had taken high school chemistry was compared with those who had not taken high school chemistry. The results of the survey showed that 63.2 per cent of those who had not taken high school chemistry failed as compared with a failure of 20.8 per cent for those who had taken high school chemistry. Furthermore, those students who had no previous work in chemistry were unable to achieve a grade point average above 3.00 in chemistry, but 15.0 per cent of those who had taken high school chemistry had achieved a grade point average between 3.00 and 4.00 in chemistry. The data reported in this study suggest that college students without a background in high school chemistry may have difficulty or may be unable to earn a grade point average above 3.00 in college chemistry.

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[1] Alfred J. Perkins, "Achievement in General College Chemistry Versus Scores from Various Entrance Tests," American Journal of Pharmaceutical Education, XXI (1957), 387-91.

Since 1950, the professional objectives of senior pharmacy students have been annually surveyed at the Brooklyn College of Pharmacy.[1] In 1950, 82.7 per cent of these senior students were interested in retail pharmacy. However, in 1955, though retailing was still the first choice, it had dropped to 51.0 per cent. The two main areas which increased at the expense of the retailing area were detailing and selling, and graduate study and research. In 1950, detailing and selling accounted for 4.9 per cent, and graduate study and research accounted for only 4.2 per cent. However, in 1955, the per cents for these two areas were 6.6 per cent and 16.0 per cent respectively. It appears from the data reported in this study, that although retailing is usually the first choice in more than half the cases, it is losing appeal as a professional objective.

A review of the literature also reveals that the college testing programs on pharmacy vary considerably. The Committee on Predictive Tests of the American Association of Colleges of Pharmacy circulated a questionnaire to its members in the fall of 1959 to determine the testing programs presently used in member colleges. Fifty-four replies were received and the following information was obtained from the questionnaires returned:

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[1] Isidore Greenberg and Arthur G. Zupko, "Four Years of Experience with a Post-Graduate Guidance Program at the Brooklyn College of Pharmacy," American Journal of Pharmaceutical Education, XXIV (1960), 336-41.

1. Nearly all schools replying test first-year students, and about half the schools test transfer students.

2. Slightly over half of the schools responding have had a testing program in effect for ten or more years.

3. Almost all the schools have the aid of an educational consultant, although the most frequent type of assistance provided was that of scoring.

4. The cost of the testing program per student varied from fifty cents to fifteen dollars, with most of the schools making no charge to the students.

5. Only ten of those schools replying indicated a testing program solely for pharmacy students.

6. More than half of the schools responding had evidence of reliability and validity of results obtained by their testing programs based on various types of correlation and evaluation studies, and others claimed such studies were in progress.

7. Two schools indicated that their testing program was the only criterion used for admission. Other criteria given by various colleges included: the high school average (being used by twenty-eight of the fifty-four schools); the recommendation of the principal (by fourteen); and the College Boards (by twelve schools).

8. Ten schools require an interview prior to admission but only five of these have "professionally trained" interviewers. The number of people interviewing each applicant varied from one to three or more, with the tendency in favor of one interviewer. The average length of the session varied from ten to sixty minutes, with most of the interviews being conducted singly.

9. Four colleges replied that less than 50 per cent of the students beginning the freshman year complete it, but the majority of the schools find that 70 per cent or more complete the sophomore year successfully.

10. Major causes of attrition varied considerably according to the replies, but the most common cause was "scholastic." Eighteen colleges attributed this cause to account for 18 to 90 per cent of attrition. Nine schools answered that finances were a principal

cause of attrition, and four said that outside work was a principal cause.[1]

In summary, extensive research has been conducted on academic achievement as related to interest tests in the areas of medicine, dentistry, law, engineering, teaching, and other professional areas. However, there is a paucity of such research in pharmacy with the studies by Remmers, Gage, and Drucker, and Milton Schwebel being the only signal studies in this area. In view of the high mortality rate of students during their first two years in the pharmacy program, there is a need for more predictive research which will aid in identifying those students who are likely to succeed or fail in the pharmacy program. There is also a need for greater uniformity of testing and selection procedures in the colleges of pharmacy so that results may be more readily compared. These needs became even more acute in 1960 when the length of the pharmacy program was changed from four to five years. Notable studies have been made in recent years in improving present selection procedures in the colleges of pharmacy, but more should be done if we hope to reduce the high mortality rate of the first and second year pharmacy students.

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[1]K. L. Kaufman, American Journal of Pharmaceutical Education, A Report of the Committee on Predictive Tests, XXV (1961), 89-90.

CHAPTER III

LIMITATIONS OF THE STUDY

Limited to Pharmacy Students

The main reason for limiting this study to pharmacy students is that the pharmacy program at Ferris Institute has one of the highest student mortality or drop-out rates in the entire college. As previously mentioned, 60 per cent of the pharmacy students drop out or discontinue the study of pharmacy by the end of their second year. In comparison, the drop-out rate for students in the School of Commerce is approximately 25 per cent for the first year, and an additional 15 per cent in the second year.[1] In the school of General Education, the student drop-out rate is approximately 30 per cent for the first year, and an additional 10 to 15 per cent for the second year.[2] On the basis of this higher student drop-out rate in the School of Pharmacy, there is a need for studies which might aid in identifying those students who are likely to succeed or fail during their first two years in the pharmacy program.

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[1]Interview with Dr. Stephen J. Turille, Dean of the School of Commerce, and Dr. Benjamin F. Thomas, Associate Dean of the School of Commerce, Ferris Institute, Big Rapids, Michigan, November 19, 1962.

[2]Interview with Dr. John L. Johnson, Assistant Dean of the School of General Education, Ferris Institute, Big Rapids, Michigan, November 19, 1962.

The second reason for limiting the study to pharmacy students is that the pharmacy program at Ferris Institute is less diversified than some of the other educational programs at the college as it is designed mainly to produce retail pharmacists. In comparison, the Accounting Department in the School of Commerce is organized to prepare students for work in industrial accounting, C. P. A. accounting, and governmental accounting.[1] The Marketing Department, also in the School of Commerce, is even more diversified in its curriculum objectives, for it is organized to prepare students for careers in buying, store management, selling, sales management, advertising, and to a lesser extent for careers in purchasing and marketing research.

The third reason for studying pharmacy students is that the pharmacy program at Ferris Institute is quite comparable to the pharmacy programs at other colleges and universities throughout the United States. This degree of uniformity exists, because the curriculum recommendations of the A. A. C. P. (American Association of Colleges of Pharmacy) are generally followed by member colleges. There are comparable associations in the fields of Accounting and Marketing -- the A. A. A. (American Accounting Association) and the A. M. A. (American Marketing Association). These latter associations will make curriculum recommendations

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[1]Interview with Dr. P. Lowell Chapman, Head of the Accounting Department, Ferris Institute, Big Rapids, Michigan, November 19, 1962.

from time to time, but their influence is not as great as the influence exerted by the A.A.C.P. because they (the A.A.A. and A.M.A.) do not have a separate association for the colleges. Inasmuch as the pharmacy program at Ferris Institute is quite similar to other pharmacy programs throughout the United States, it can be compared more readily with other colleges and universities.

The fourth reason for studying pharmacy students is that the pharmacy program at Ferris Institute has a sufficient number of similar students from which to draw a sample. For example, all students enrolled in the School of Pharmacy are five-year pharmacy students, and they all follow the same program of instruction. However, students enrolled in accounting or marketing have the option of following a one-, two-, or four-year program. Moreover, as previously mentioned, accounting students may be interested in pursuing careers in industrial accounting, C.P.A. accounting, or governmental accounting; and marketing students may pursue careers in buying, store management, selling, sales management, advertising, purchasing, or marketing research. As a consequence of this greater curriculum and occupational homogeneity among pharmacy students, larger sample numbers could be obtained in studying the students in the pharmacy program.

Finally, the selection of medical, dental, veterinarian, psychology, nursing, engineering, law, teaching, and other professional students has been more extensively researched

than the selection of pharmacy students. The research dealing with the selection of pharmacy students is very limited, and in view of the high mortality rate of pharmacy students during their first two years in the pharmacy program, there is need for more research in this area.

In summary, then, the pharmacy students at Ferris Institute were studied for the following reasons:

1. First, in comparison with the other programs at Ferris Institute, the pharmacy program has the highest student drop-out or mortality rate.
2. The pharmacy program at Ferris Institute has had a greater degree of stability and permanence in comparison with many other programs at Ferris Institute.
3. The occupational objectives of the pharmacy program at Ferris Institute are less diversified than the occupational objectives of many other educational programs at Ferris Institute.
4. Because of the similarity of the pharmacy program at Ferris Institute with pharmacy programs at other colleges and universities, it can be compared more readily with other pharmacy programs throughout the United States.
5. The homogeneity of pharmacy students at Ferris Institute as compared with students in other programs at Ferris Institute provided for larger sample numbers.
6. The number of research studies dealing with the selection of pharmacy students is very limited, and there is need for more predictive research in this area.

Limited to the First Two Years of Study

This study was limited to the first two years of study in the pharmacy program for the following reasons: First, these two years are the most difficult years in the pharmacy program because of the heavy concentration of courses in chemistry, biology, physics, and mathematics. The difficulty of the first two years in the pharmacy program is also reflected in the number of student drop-outs. There is a 60 per cent student drop-out rate for the first two years and only an additional 10 to 15 per cent student drop-out rate for the third and fourth years.[1]

Secondly, effective counseling is generally more important during the first two years because there is usually more vocational uncertainty and failure among pharmacy students in these years than in subsequent years.[2]

Limited to the School Years 1958-59 and 1959-60

This study was limited to the school years 1958-59 and 1959-60 for three reasons: First, a greater number of pharmacy students had taken the Strong Vocational Interest Test during these two years than in previous years. Secondly, the study was not extended beyond these two particular years because of a change in the length of the pharmacy program. If the

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[1]Interview with Dr. Edward P. Claus, Dean of the School of Pharmacy, Ferris Institute, Big Rapids, Michigan, November 19, 1962.

[2]Interview with Dr. Donald L. Hecker, Director of the Counseling Staff, Ferris Institute, Big Rapids, Michigan, July 19, 1962.

school year 1970-71 had been included, it would have resulted in comparing four-year pharmacy students with five-year pharmacy students, as the pharmacy program was lengthened to five years in April, 1960. Thirdly, two school years were selected rather than one in order to obtain adequate sample numbers for each pharmacy group, particularly Pharmacy Groups 2 and 3 which contain 25 and 20 students respectively as compared with 45 and 80 students for Pharmacy Groups 1 and 4 respectively.[1]

Limited to Male Pharmacy Students

This study included only male pharmacy students. Female pharmacy students were excluded, because they constituted such a small number of the total enrollment. For example, out of a total of 114 pharmacy students for the freshman year of 1958-59, there were only 20 women; and for the freshman year of 1959-60, there were only 25 women enrolled out of a total of 149 pharmacy students. Secondly, the study was limited to men, because a different Strong Vocational Interest Test with different scale values is administered to women. Finally, the study was limited to men, because pharmacy is an occupation which is generally pursued by men.

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[1]For a more detailed explanation of the numbers in each pharmacy group, the reader should refer to Table 3 on page 29.

CHAPTER IV

METHODOLOGY

Sample Selection Procedures and Case Exclusions

There was a total of 114 pharmacy freshmen for the school year 1958-59, and a total of 149 for the school year 1959-60. However, the net or final number of pharmacy students used in the study for each of these years was 73 and 100 respectively. In addition to excluding all female pharmacy students, the following freshmen male pharmacy students were also excluded:

1. Those who had not taken the Strong Vocational Interest Test;[1]

2. Those who had blank or incomplete keys on the Strong Vocational Interest Test;

3. Those who had taken the Strong Vocational Interest Test later than three weeks from the date of their initial enrollment;

4. Those who had previous collegiate instruction or transfer credits;

5. Those who had no personal data sheet on file either in the Registrar's Office or in the Counselling Office;

6. Those who had no grades recorded;

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[1]Some pharmacy students did not take the Strong Vocational Interest Test because they were absent on the day the test was administered.

7. Those who were suspended from Ferris Institute for social reasons;

8. Those who left college because of personal illness, injury, or death;

9. Those students in Pharmacy Group 1 who had earned fewer than 84 quarter hours of credit.

Table 2 shows a summary breakdown of each of the latter case exclusions. The first three classifications account for a total of 31 or approximately 74 per cent of the male case exclusions, and the balance of 26 per cent was caused by the remaining six classifications.

TABLE 2--Distribution of male case exclusions for the school years 1958-59 and 1959-60

Description of the Male Case Exclusions	School Year 1958-59	1959-60
No Strong Test	8	2
Incomplete Strong Test Scores	5	8
Strong Test Taken after Three Weeks	3	5
Previous Collegiate Instruction or Transfer Credits	--	1
No Personal Data Sheet	--	1
No Grades Recorded	1	3
Social Suspension	1	--
Personal Illness, Injury, or Death	1	--
Pharmacy Group 1 Students with Fewer than 84 Quarter Hours of Credit	2	1
Totals	(21)	(21)

Pharmacy Group Structures

For the purpose of differentiating between successful and unsuccessful pharmacy students, the following four pharmacy group structures were used in this study:

Pharmacy Group 1 is composed of those students who have maintained a cumulative grade point average of 2.00 or above for six consecutive quarters with a minimum of 84 quarter hours completed, and who, at the end of this period, are continuing the study of pharmacy.[1]

Pharmacy Group 2 is composed of those students who have a cumulative grade point average of 2.00 or above who have discontinued the study of pharmacy any time during the first six quarters of their enrollment.

Pharmacy Group 3 is composed of those students who have a cumulative grade point average below 2.00 after six quarters of study who are continuing the study of pharmacy.

Pharmacy Group 4 is composed of those students who have a cumulative grade point average below 2.00 who have discontinued the study of pharmacy any time during the first six quarters of their enrollment.

The distribution of cases for each pharmacy group in this study by school years is shown in Table 3. The two

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[1]The figure of 84 quarter hours is not an arbitrary one, for it is based on 14 quarter hours per quarter for six consecutive quarters. Fourteen quarter hours per quarter is also the minimum number of hours required for a full load by the Registrar's Office at Ferris Institute and the Veteran's Administration for those students receiving aid.

largest groups are Pharmacy Groups 1 and 4, and the two smallest groups are Pharmacy Groups 2 and 3.

TABLE 3 -- Distribution of case numbers for each pharmacy group for the school years 1958-59 and 1959-60.

Pharmacy Group	1958-59	1959-60	Totals	Per Cent of Total
Group 1	15	33	48	27.7
Group 2	11	14	25	14.5
Group 3	6	14	20	11.6
Group 4	41	39	80	46.2
Totals	(73)	(100)	(173)	(100.0)

Moreover, a total of 73 students, or 42.2 per cent, (Pharmacy Groups 1 and 2) have a cumulative grade point average of 2.00 or above, and 100 students, or 57.8 per cent, (Pharmacy Groups 3 and 4) have a cumulative grade point average below 2.00.

SVIB Occupational Group Structures

Scores by pharmacy students used in this study were recorded on the Standard Hankes Report form for the SVIB. The Interest Maturity, Occupational Level, and Masculinity-Femininity scales were omitted from this study because they are not occupational keys, and they are also measured on a different scale. Therefore, forty-five occupational keys and the following thirteen occupational groups of the SVIB were included in this study:[1]

[1] A listing of the separate keys within each occupational group of the SVIB appears on page 64 in the appendix.

Grp. I	Biological Science	Grp. VIII	Business
Grp. II	Physical Science	Grp. VIII-A	(Business-Numerical)
Grp. III	Production Manager	Grp. VIII-B	(Business-Science)
Grp. IV	Technical	Grp. IX	Business Contact
Grp. V	Social-Welfare	Grp. X	Verbal-Linguistic
Grp. VI	Musician	Grp. XI	President of a Manufacturing Concern
Grp. VII	Certified Public Accountant		

Two additional groups were added by sub-dividing the SVIB Occupational Group VIII into two separate groups which are designated throughout this study as the SVIB Occupational Groups VIII-A and VIII-B. The SVIB Occupational Group VIII-A is composed of the senior C.P.A., accountant, office man, purchasing agent, and banker keys; and the SVIB Occupational Group VIII-B is composed of the mortician and pharmacist keys. These two additional occupational groups were included because the counseling staff at Ferris Institute analyzes the SVIB Occupational Group VIII as two separate groups. Their experience with this group seems to indicate the emergence of the mortician and pharmacist keys as a separate occupational group.[1]

The Strong Vocational Interest Blank was studied on the basis of group interests rather than specific occupational interests, because group patterns are used by the counseling staff at Ferris Institute in advising students. Moreover, there are serious dangers in referring to specific occupations, particularly when counseling high school students or first and second year college students. Many of these students are vocationally indecisive and have not decided upon a specific

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[1]Interview with Dr. Donald D. Hecker, Director of the Counseling Staff, Ferris Institute, Big Rapids, Michigan July 19, 1962.

occupation per se. Therefore, it appears advisable to counsel them in terms of general occupational patterns rather than precise and specific occupations.

Strong himself emphasizes this same position by stating that:

> There are some disadvantages in telling a young man that he has the interests of a specific occupation, as, for example, a chemist. This is particularly true when he is still in high school or even in the first year or two of college. Acting upon such counsel too many young people prepare themselves too narrowly for that occupation. If, on the other hand, the young man is told he has the interests of men engaged in the physical sciences--including physics, chemistry, mathematics, engineering, and geology--the student is far more likely to take courses in all these fields and so establish a much broader foundation for any specialization he may achieve later on.[1]

Super also stresses this same point by stating, "It is manifestly unwise, . . . to play up scores on specific occupations. . . . The use of interest patterns has been found more valid, with entry into an occupation as a criterion, than specific occupational scores."[2] Darley and Wightwick also emphasize the importance of pattern analysis in counselling.[3,4]

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[1] Edward K. Strong, Jr., Vocational Interests of Men and Women (California: Stanford University Press, 1943), p. 169.

[2] D. E. Super, Appraising Vocational Fitness by Means of Psychological Tests (New York: Harper and Brothers, 1949), pp. 414-15.

[3] J. G. Darley, Clinical Aspects and Interpretation of the Strong Vocational Interest Blank (New York: Psychological Corporation, 1941) Chs. 3 and 5.

[4] M. D. Wightwick, Vocational Interest Patterns, No. 900 (New York: Teachers College Contributions to Education, 1945) pp. 81-2.

Alva C. Cooper also reiterates this position by saying:

> When Strong developed the Group Scales he had in mind a solution to the problem of over-emphasis on specific occupations, for Group Scales were designed to represent the individual occupations in the occupational clusters upon which the group scales were based. Group Scales were constructed for use in counselling students who were preparing for future specialization.[1]

Eight Pharmacy Group Comparisons

The following eight pharmacy group comparisons were made in this study:

Pharmacy Group 1 vs. 2
Pharmacy Group 1 vs. 3
Pharmacy Group 1 vs. 4
Pharmacy Group 2 vs. 3
Pharmacy Group 2 vs. 4
Pharmacy Group 3 vs. 4
Pharmacy Groups 1 + 2 vs. 3 + 4
Pharmacy Groups 1 + 3 vs. 2 + 4

The first six comparisons were designed to test for differences among the four pharmacy groups. The Pharmacy Groups 1 + 2 vs. 3 + 4 comparison was designed to test for differences between pharmacy students who earn a cumulative grade point average of 2.00 or above and pharmacy students who earn a cumulative grade point average below 2.00. The Pharmacy Groups 1 + 3 vs. 2 + 4 comparison was designed to test for differences between pharmacy students who continue the study of pharmacy and pharmacy students who discontinue the study of pharmacy.

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[1] Alva C. Cooper, "The Strong Group Scales and Primary Interest Patterns," The Personnel and Guidance Journal, (March, 1958), 464.

Structure of Primary, Secondary, Neutral, and Reject Patterns

The procedure used for analyzing student scores on the Strong Vocational Interest Blank was a modification of the methods used by Darley and Hagenah in 1955.[1] In their study, each profile was examined for the presence of primary, secondary, and reject patterns. A primary pattern included the majority of A and B+ scores; a secondary pattern included the majority of B+ and B scores; and the reject pattern included the majority of scores below the chance area on the profile. In addition, single-occupation groups were added to groups with which they had the highest intercorrelations. Production manager was added to Group IV; C. P. A. was included in Group X; and president of a manufacturing concern was added to Group IX. Because of low intercorrelations with other occupational groups, the musician key was omitted from the analyses. Moreover, each interest profile was analyzed independently by two judges; and in the event of disagreement, a third judge was used. This same method was also used by Lawrence Stewart in 1959 in his study on the interest patterns of a group of high-ability and high-achieving students.[2]

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[1] J. G. Darley and Theda Hagenah, Vocational Interest Measurement (Minneapolis: University of Minneapolis Press, 1955).

[2] H. Lawrence Stewart, "Interest Patterns of a Group of High-Ability, High-Achieving Students," Journal of Counselling Psychology, VI (1959), 132-39.

The desirability of including a reject pattern is also supported by Strong who states:

> Low scores of C+ and especially C have been too much ignored by counselors. Use of the shaded areas calls attention to the fact that when such low ratings fall definitely below the range of chance scores, they assume real meaning, i.e., the individual very clearly does not possess the interests of those occupations.[1]

In their studies on interest, Hahn and Trinkaus also refer to the importance of carefully analyzing reject scores.[2,3]

In keeping with these previous research studies, this study also incorporates a reject pattern. However, the procedures for analyzing student scores on the SVIB are characterized by the following differences when compared with the method used by Darley and Hagenah in 1955: A primary pattern was recorded if 50 per cent or more of the scores within the occupational group fell within the A to B+ range, and also, if fewer than 50 per cent of the remaining scores within that group were in the reject area. A secondary pattern was recorded if 50 per cent or more of the scores fell within the A to B- range. A reject pattern was recorded if 50 per cent or more of the scores fell below the chance area

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[1]Edward K. Strong Jr., Vocational Interests of Men and Women (California: Stanford University Press), 1943, pp. 87-89.

[2]M. E. Hahn, "An investigation of Measured Aspects of Social Intelligence in a Distributive Occupation" (Doctoral dissertation, University of Minnesota, 1942).

[3]W. K. Trinkaus, "The Permanence of Vocational Interests of College Freshmen," Educational Psychology Measurement Journal, XIV (1954), 641-46.

with fewer than 50 per cent of the remaining scores within the group in the primary or secondary areas. A neutral pattern was recorded if 50 per cent or more of the scores fell within the chance or C+ ranges; or if the scores did not qualify as either a primary, secondary, or reject pattern, they were also recorded as a neutral pattern.

A neutral pattern was included because, in many instances, a group of scores did not clearly represent a primary, secondary, or reject pattern. Furthermore, it is not uncommon for an individual, owing to his lack of information about various occupations, to be completely indifferent about a particular occupational group.

The order for classifying each group was first to examine the scores to determine if they qualified for a primary pattern. If not, they were examined to see if they would fit a secondary pattern. Again, if they failed to qualify, they were further examined to see if they would fit a reject pattern. Therefore, through the process of elimination, if the scores did not qualify as any of the latter three patterns, they automatically became a neutral pattern.

In addition, the single-occupational groups were not added to other groups, nor was the musician key omitted from the study. Two judges analyzed the profiles independently, and all disagreements were uniformly and consistently resolved by referring to the supplementary instructions on scoring.

These supplementary instructions were necessary, because the reader will note that the SVIB occupational

groups which contain an odd number of keys (Group I with seven keys, Group III with one key, Group IV with nine keys, Group VI with one key, Group VII with one key, Group VIII-A with five keys, Group VIII with seven keys, Group IX with three keys, Group X with three keys, and Group XI with one key) present no difficulty in determining whether 50 per cent or more of the scores are within one pattern classification or another. However, the SVIB occupational groups which contain an even number of keys (Group II with four keys, Group V with eight keys, and Group VIII-B with two keys) present a special problem, because half of the scores within the group could qualify for one pattern classification, and the other half could qualify for another pattern classification. In order to resolve such conflicts in a systematic and consistent manner, the following system was devised for determining which interest classification would prevail:

1. With groups composed of two keys: one primary score and one neutral score were classified as a primary pattern; one primary score and one reject score were classified as a neutral pattern; one neutral score and one secondary score were classified as a secondary pattern; one primary score and one secondary score were classified as a primary pattern; and one secondary score and one reject score were classified as a neutral pattern.

2. With groups composed of four keys: two reject scores and two secondary scores were classified as a neutral pattern; and two secondary scores, one neutral score, and one reject score were classified as a secondary pattern.

3. And with the SVIB Occupational Group V containing eight keys: four reject scores and four secondary scores were classified as a neutral pattern; and four secondary scores, two neutral scores, and two reject scores were classified as a secondary pattern.

Statistical Procedures

Tests for significant differences among the pharmacy groups were made by using the following chi-square formula which corrects for continuity:[1]

$$\chi^2 = \frac{N\left(|AD - BC| - \frac{N}{2}\right)^2}{(A+B)(C+D)(A+C)(B+D)}$$

The symbols in this formula have the following meaning:

N = the total number of scores in all four cells.
A = the number of Primary + Secondary scores for the first group.
B = the number of Neutral + Reject scores for the first group.
C = the number of Primary + Secondary scores for the second group.
D = the number of Neutral + Reject scores for the second group.

Two by 4 table tests were not used in this study because more than 20 per cent of the cells had an estimated frequency of less than 5. There was a total of 832 cells in the 2 by 4 table tests and 188 (or 22.6 per cent) of these cells had estimated frequencies of less than 5. In the 2 by 2 table tests,

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[1]This chi-square formula was taken from the textbook by Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Company, Inc., 1956) p. 109.

however, there was a total of 416 cells and 14 (or only 3.4 per cent) of these cells had estimated frequencies below 5.[1,2]

Research studies based on the chi-square test generally use the 5 per cent level of significance as the level necessary for establishing significance. This same practice was followed in this study and 10 per cent levels of significance are included in the tables simply to indicate possible tendencies.

The levels of significance for a 2 by 2 table test were determined by referring to the table of critical values of chi-square appearing on page 249 of the textbook by Sidney Siegel.[3] For a 2 by 2 table test with 1 degree of freedom the chi-square values and their respective levels of significance are as follows:

Chi-Square Values	Levels of Significance (per cent)
2.71	10
3.84	5
5.41	2
6.64	1
10.83	.1

The chi-square technique was used because of its suitability and appropriateness for the data involved in this study. Moreover, most studies dealing with interest as a predictor of academic success have employed the correlation

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[1]Two by 2 tables were constructed by combining scores in the first two columns (Primary + Secondary scores) and comparing them with combined scores in the last two columns (Neutral + Reject scores).

[2]The distributions of estimated cell frequencies below 5 for a 2 by 4 table test and a 2 by 2 table test appear on page 114 in the appendix.

[3]Ibid, p. 249.

method with only limited success. It was believed, therefore, that a chi-square or frequency technique might be of greater value in determining differences among the four pharmacy groups in this study. Lawrence Stewart, in his study on interest patterns of high-achieving students, also recommends the frequency approach by stating:

> Strong (1955) has also questioned the appropriateness of correlation techniques for showing true relationships between interests and abilities. Despite the low correlations, he felt that ability must be important in the development of vocational interests. Perhaps analyses of types and frequencies of interest patterns on the Strong Blank will provide additional insight into this relationship.[1]

In testing if there is a significant difference between Pharmacy Group 1 and Pharmacy Group 2, and also between Pharmacy Group 3 and Pharmacy Group 4, as measured by the mean grade point average for each pharmacy group, the following formula was used:[2]

$$z = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

The symbols in this formula have the following meaning:

$\overline{X}$ = the mean cumulative grade point average of the group.
σ = standard deviation.
N = the total number of cases in the group.

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[1] H. Lawrence Stewart, "Interest Patterns of a Group of High-Ability, High-Achieving Students," Journal of Counseling Psychology, VI (1959), 132-39.

[2] This Z formula was taken from the textbook by Helen Walker and Joseph Lev, Statistical Inference, (New York: Henry Holt and Co., Inc., 1953), p. 155.

In determining if there is a significant difference between the "D" and "E" grades earned by pharmacy students in the Pharmacy-Science-Mathematics courses and the "D" and "E" grades earned by pharmacy students in the Non-Pharmacy-Science-Mathematics courses, the same chi-square formula that appears on page 37 was used. Moreover, the PSM courses included the following six subjects: biology, chemistry, mathematics, pharmacy, physics, and public health. The Non-PSM courses included the following thirteen subjects: accounting, commerce, communication skills, economics, history, humanities, law, music, political science, psychology, social science, sociology, and speech.[1]

In an effort to insure for accuracy, all data appearing in this study were computed independently by two different persons. Their computations were then checked against each other. If a discrepancy was found between the matched data, they were re-computed a third time to determine which answer should prevail.

Procedures for Recording the Strong Scores

The student score for each key on the Strong Vocational Interest Test is indicated by a heavy, vertical line drawn in red. In several instances, however, this line overlapped or covered two score markings. Moreover, the line rather than being completely vertical sometimes slanted and thereby caused a score overlap. In order to interpret and record all scores

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[1]The complete listing of these subjects with their respective descriptions and quarter hours of credit appears on pages 80-82 in the appendix.

in a uniform and consistent manner, the following procedures were applied: If the red line covered more than one score, the score which was covered more heavily was the score which was recorded. Secondly, if the red line slanted and covered more than one score, the top of the line was used to determine which score should be recorded.

CHAPTER V

HYPOTHESES

This study involved thirteen SVIB occupational groups, four interest pattern classifications, and four pharmacy groups.[1] These several different groups or structures made it possible to formulate an extensive number of hypotheses. However, on the basis of discussions with members of the School of Pharmacy and members of the counselling staff at Ferris Institute regarding the interests and academic achievement of pharmacy students, it was believed desirable to limit the study to the following six hypotheses:

Hypothesis Number 1

There are no differences among the students in the four pharmacy groups as measured by their scores on thirteen occupational groups of the Strong Vocational Interest Blank (SVIB).

Hypothesis Number 2

There are no differences between pharmacy students with a cumulative grade point average above 2.00 and pharmacy students with a cumulative grade point average below 2.00

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[1] The thirteen SVIB occupational groups are defined and discussed on pages 29 to 30, the interest pattern classifications are defined and discussed on pages 33 to 37, and the four pharmacy groups are defined and discussed on page 28.

(Pharmacy Groups 1 + 2 vs. Pharmacy Groups 3 + 4) as measured by their occupational group scores on the SVIB.

Hypothesis Number 3

There are no differences between pharmacy students who continue the study of pharmacy and pharmacy students who discontinue the study of pharmacy (Pharmacy Groups 1 + 3 vs. Pharmacy Groups 2 + 4) as measured by their occupational group scores on the SVIB.

Hypothesis Number 4

There is no difference between the students in Pharmacy Group 1 and the students in Pharmacy Group 2 as measured by the mean cumulative grade point average for each group.

Hypothesis Number 5

There is no difference between the students in Pharmacy Group 3 and the students in Pharmacy Group 4 as measured by the mean cumulative grade point average for each group.

Hypothesis Number 6

There is no difference between the proportion of "D" and "E" grades earned by pharmacy students in the Pharmacy-Science-Mathematics courses and the proportion of "D" and "E" grades earned by pharmacy students in the Non-Pharmacy-Science-Mathematics courses for each of the pharmacy groups studied.

CHAPTER VI

FINDINGS

The six hypotheses in this study were designed to determine if there were differences between successful and unsuccessful pharmacy students as measured by their scores on the Strong Vocational Interest Blank (SVIB), by their cumulative grade point averages, and by their grades in Pharmacy-Science-Mathematics courses (PSM courses) versus their grades in Non-PSM courses. The first three hypotheses are related to the scores expressed by successful and unsuccessful pharmacy students on the SVIB. Hypotheses Number 4 and 5 are related to the mean cumulative grade point average for each of the pharmacy groups studied, and Hypothesis Number 6 is related to the grades earned by successful and unsuccessful pharmacy students in the PSM courses and the Non-PSM courses. The findings as related to these six hypotheses are as follows:

Findings Related to Hypothesis Number 1

Hypothesis Number 1 stated there are no differences among the students in the four pharmacy groups as measured by their occupational group scores on the SVIB.[1] On the basis

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[1]The four pharmacy groups are defined and discussed on page 28.

of the data reported in this study, Tables 4 and 5 show that the null hypothesis is supported in relation to twelve of the SVIB occupational groups and rejected in relation to the SVIB Occupational Group X which produces three significant differences. All three of these differences are significant beyond the 5 per cent level, and are also related to the Pharmacy Group 2 comparisons.[1] In comparing Pharmacy Group 3 with Pharmacy Group 4, the SVIB Occupational Group VIII-A produces a chi-square value of 2.74. This value, however, is significant at the 10 per cent level which is too low for reliable prediction. The reported data, therefore, support the null hypothesis in relation to twelve of the SVIB occupational groups, and reject the null hypothesis in relation to the SVIB Occupational Group X which produces three significant differences in comparing Pharmacy Group 2 with each of the other pharmacy groups.

Findings Related to Hypothesis Number 2

Hypothesis Number 2 stated that there are no differences between pharmacy students with a cumulative grade point average

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[1] It should be noted that in the Pharmacy Group 2 vs. Pharmacy Group 1 comparison, cell C has an estimated frequency of 4.45. In the Pharmacy Group 2 vs. Pharmacy Group 3, cell C has an estimated frequency of 4.44. In the Pharmacy Group 2 vs. Pharmacy Group 4, cell A has an estimated frequency of 4.29. The 10 per cent level of significance produced by the SVIB Occupational Group VIII-A in the Pharmacy Group 3 vs. Pharmacy Group 4 comparison has no estimated cell frequency below 5. The 2 by 4 and 2 by 2 table test distributions for cells with estimated frequencies below 5 appear on page 114 in the appendix.

TABLE 4--Chi-square values for a 2 by 2 table test for twelve pharmacy group comparisons on thirteen SVIB occupational groups[1,2,3]

Pharmacy Group Comparisons	SVIB Occupational groups												
	I	II	III	IV	V	VI	VII	VIII	VIII-A	VIII-B	IX	X	XI
1 vs. 2	.31	.84	.01	.52	1.79	1.93	.21	.07	.32	.03	1.02	6.81***	1.50
1 vs. 3	.03	1.24	.00	.06	.49	.07	.02	.39	.75	1.57	.03	.00	.31
1 vs. 4	.10	1.63	.25	.17	2.20	.21	.01	.21	.61	.64	2.12	.05	.03
2 vs. 1	.31	.84	.01	.52	1.79	1.93	.21	.07	.32	.03	1.02	6.81***	1.50
2 vs. 3	.00	.00	.06	.28	.01	.34	.43	.84	.00	.48	.09	4.51**	.03
2 vs. 4	.05	.02	.00	1.63	.01	1.05	.21	.03	2.00	.00	.04	6.56***	1.13
3 vs. 1	.03	1.24	.00	.06	.49	.07	.02	.39	.75	1.57	.03	.00	.31
3 vs. 2	.00	.00	.06	.28	.01	.34	.43	.84	.00	.48	.09	4.51**	.03
3 vs. 4	.02	.02	.30	.02	.00	.02	.07	1.34	2.74*	.48	.21	.17	.13
4 vs. 1	.10	1.63	.25	.17	2.20	.21	.01	.21	.61	.64	2.12	.05	.03
4 vs. 2	.05	.02	.00	1.63	.01	1.05	.21	.03	2.00	.00	.04	6.56***	1.13
4 vs. 3	.02	.02	.30	.02	.00	.02	.07	1.34	2.74*	.48	.21	.17	.13

[1]A single asterisk (*) appears beside those chi-square values which are significant at the 10 per cent level of significance, a double asterisk (**) appears beside those chi-square values which are significant at the 5 per cent level of significance, and three asterisks (***) appear beside those chi-square values which are significant at the 1 per cent level of significance.

[2]The statistical formula used to compute the chi-square values in this table appears on page 37 in Chapter IV.

[3]The distribution of primary + secondary scores and neutral + reject scores for each SVIB occupational group for the twelve pharmacy group comparisons in this table appears on pages 105-112 in the appendix.

TABLE 5--Chi-square values and their respective levels of significance and distribution of primary + secondary and Neutral + reject scores for four selected pharmacy groups with reference to the SVIB Occupational Groups VIII-A and X[1,2]

Pharmacy Group Comparisons	SVIB Occ. Grps.	Chi-Square Values	Levels of Significance	Primary + Secondary Scores		Per Cent of Total	Neutral + Reject Scores	Per Cent of Totals	No. Totals	Per Cent Total
Grp. 3 vs. 4	VIII-A	2.74	10*	3	13	(65.0)	7	(35.0)	20	(100.0)
				4	33	(41.3)	47	(58.8)	80	(100.1)
				Totals	46		54		100	
Grp. 2 vs. 1	X	6.81	1***	2	9	(36.0)	16	(64.0)	25	(100.0)
				1	4	(8.3)	44	(91.7)	48	(100.0)
				Totals	13		60		73	
Grp. 2 vs. 3	X	4.51	4**	2	9	(36.0)	16	(64.0)	25	(100.0)
				3	1	(5.0)	19	(95.0)	20	(100.0)
				Totals	10		35		45	
Grp. 2 vs. 4	X	6.56	1***	2	9	(36.0)	16	(64.0)	25	(100.0)
				4	9	(11.3)	71	(88.8)	80	(100.1)
				Totals	18		87		105	

1 A single asterisk (*) appears beside those chi-square values which are significant at the 10 per cent level of significance, a double asterisk (**) appears beside those chi-square values which are significant at the 5 per cent level of significance, and three asterisks (***) appear beside those chi-square values which are significant at the 1 per cent level of significance.

2 The SVIB Occupational Group VIII-A is composed of the Senior C.P.A., Accountant, Office Man, Purchasing Agent, and Banker keys and the SVIB Occupational Group X is composed of the Advertising Man, Lawyer, and Author-Journalist keys.

above 2.00 and pharmacy students with a cumulative grade point average below 2.00 as measured by their occupational group scores on the SVIB. On the basis of the data reported in this study, Table 6 shows that the null hypothesis is supported for a comparison between Pharmacy Groups 1 + 2 and Pharmacy Groups 3 + 4 produces no significant differences on any of the SVIB occupational groups.

Findings Related to Hypothesis Number 3

Hypothesis Number 3 stated that there are no differences between pharmacy students who continue the study of pharmacy and pharmacy students who discontinue the study of pharmacy as measured by their occupational group scores on the SVIB. On the basis of the data reported in this study, Table 7 shows that the null hypothesis is supported for a comparison between Pharmacy Groups 1 + 3 and Pharmacy Groups 2 + 4 produces no significant differences on any of the SVIB occupational groups.

Findings Related to Hypothesis Number 4

Hypothesis Number 4 stated that there is no difference between the students in Pharmacy Group 1 and the students in Pharmacy Group 2 as measured by the mean cumulative grade point average for each group. Table 8 shows that Pharmacy Group 1 has a mean cumulative grade point average of 2.55 for the combined school years, and Pharmacy Group 2 has a mean cumulative grade point average of 2.47 for the combined school years. However, a Z test for significant differences

TABLE 6--Chi-square values for a 2 by 2 table test for Pharmacy Groups 1 + 2 vs. Pharmacy Groups 3 + 4 on thirteen SVIB occupational groups[1,2]

	SVIB Occupational Groups												
	I	II	III	IV	V	VI	VII	VIII	VIII-A	VIII-B	IX	X	XI
Chi-square Values	.00	1.15	.04	.91	.78	.00	.09	.02	.66	1.19	.77	1.61	.00

TABLE 7--Chi-square values for a 2 by 2 table test for Pharmacy Groups 1 + 3 vs. Pharmacy Groups 2 + 4 on thirteen SVIB occupational groups

	SVIB Occupational Groups												
	I	II	III	IV	V	VI	VII	VIII	VIII-A	VIII-B	IX	X	XI
Chi-square Values	.14	.80	.53	.00	2.03	.59	.17	1.12	.93	.01	2.39	2.63	.10

[1]The statistical formula used to compute the chi-square values in this table appears on page 37 in Chapter IV.

[2]The distribution of primary + secondary scores and neutral + reject scores for each SVIB occupational group for the Pharmacy Groups 1 + 2 vs. 3 + 4 comparison appears on page 111 in the appendix, and the distribution of these scores for the Pharmacy Groups 1 + 3 vs. 2 + 4 comparison appears on page 112 in the appendix.

between these two groups produces a value of .08 which does not meet significance even at a minimal level.[1] The reported data, therefore, support the null hypothesis for there is no difference between the students in Pharmacy Group 1 and the students in Pharmacy Group 2 as measured by the mean cumulative grade point average for each group.

Findings Related to Hypothesis Number 5

Hypothesis Number 5 stated that there is no difference between the students in Pharmacy Group 3 and the students in Pharmacy Group 4 as measured by the mean cumulative grade point average for each group. Table 8 shows that Pharmacy Group 3 has a mean cumulative grade point average of 1.90 for the combined school years, and Pharmacy Group 4 has a mean cumulative grade point average of 1.50 for the combined school years. A Z test for significant differences between these two groups produces a value of 10.00 which is significant beyond the 1 per cent level of significance.[1] The reported data, therefore, reject the null hypothesis for there is a difference between the students in Pharmacy Group 3 and the students in Pharmacy Group 4 as measured by the mean cumulative grade point average for each group.

Findings Related to Hypothesis Number 6

Hypothesis Number 6 stated that there is no difference between the proportion of "D" and "E" grades earned by pharmacy students in the PSM courses and the proportion of

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[1]The statistical formula used to compute this value appears on page 39 in Chapter IV.

TABLE 8--Mean cumulative grade point averages for the four pharmacy groups for separate and combined school years[1]

School Year	Pharmacy Group 1	Pharmacy Group 2	Pharmacy Group 3	Pharmacy Group 4
1958-59	2.43 (15 cases)	2.43 (11 cases)	1.92 (6 cases)	1.47 (41 cases)
1959-60	2.60 (33 cases)	2.56 (14 cases)	1.89 (14 cases)	1.52 (39 cases)
Combined Totals	2.55 (48 cases)	2.47 (25 cases)	1.90 (20 cases)	1.50 (80 cases)

TABLE 9--Chi-square values and their respective levels of significance for a 2 by 2 table test for four pharmacy groups with reference to grades above and below "C" for the PSM courses and the Non-PSM courses[2,3,4]

Pharmacy Groups	Chi-square Values	Levels of Significance (Per Cent)
Pharmacy Group 1	43.87	.1****
Pharmacy Group 2	5.85	2 **
Pharmacy Group 3	16.57	.1****
Pharmacy Group 4	41.47	.1****

[1]The listing of the cumulative grade point average for each case in each pharmacy group appears on pages 116-119 in the appendix.

[2]The abbreviation PSM courses means Pharmacy-Science-Mathematics courses, and the abbreviation Non-PSM courses means Non-Pharmacy-Science-Mathematics courses.

[3]A double asterisk (**) appears beside those chi-square values which are significant at a level of 5 per cent or better, and four asterisks (****) appear beside those chi-square values which are significant at the .1 per cent level of significance.

[4]The statistical formula used to compute the chi-square values in this table appears on page 37 in Chapter IV.

TABLE 10--Distribution of grades above and below "C" for four pharmacy groups with reference to the PSM courses and the Non-PSM courses[1]

Pharmacy Group 1

	PSM Courses		Non-PSM Courses		
	Number	Per Cent of Total	Number	Per Cent of Total	Total
C and Above	821	(83.9)	318	(98.1)	1139
Below C	158	(16.1)	6	(1.9)	164
Totals	979	(100.0)	324	(100.0)	1303

Pharmacy Group 2

	PSM Courses		Non-PSM Courses		
	Number	Per Cent of Total	Number	Per Cent of Total	Total
C and Above	221	(83.7)	86	(94.5)	307
Below C	43	(16.3)	5	(5.5)	48
Totals	264	(100.0)	91	(100.0)	355

Pharmacy Group 3

	PSM Courses		Non-PSM Courses		
	Number	Per Cent of Total	Number	Per Cent of Total	Total
C and Above	240	(65.6)	102	(85.7)	342
Below C	126	(34.4)	17	(14.3)	143
Totals	366	(100.0)	119	(100.0)	485

Pharmacy Group 4

	PSM Courses		Non-PSM Courses		
	Number	Per Cent of Total	Number	Per Cent of Total	Total
C and Above	488	(52.5)	219	(74.0)	707
Below C	441	(47.5)	77	(26.0)	518
Totals	929	(100.0)	296	(100.0)	1225

[1]The abbreviation PSM courses means Pharmacy-Science-Mathematics courses, and the abbreviation Non-PSM courses means Non-Pharmacy-Science Mathematics courses.

"D" and "E" grades earned by pharmacy students in the Non-PSM courses for each of the pharmacy groups studied. On the basis of the data reported in this study, Tables 9 and 10 show that the null hypothesis is rejected for there is a significant difference beyond the 5 per cent level between the proportion of "D" and "E" grades earned by pharmacy students in the PSM courses and the proportion of "D" and "E" grades earned by pharmacy students in the Non-PSM courses for each of the pharmacy groups studied.[1,2]

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[1]Table 11 on pages 71-74 in the appendix shows the distribution of "A", "B", and "C" grades for the four pharmacy groups with reference to seventy-one selected courses; and Table 12 on pages 76-78 in the appendix shows the distribution of "D" and "E" grades for the four pharmacy groups with reference to fifty-two selected courses.

[2]Table 13 on pages 80-82 in the appendix shows a listing of the PSM and Non-PSM course abbreviations with their respective descriptions and quarter hours, and the suggested curriculum leading to the degree of Bachelor of Science in Pharmacy appears on pages 67-69 in the appendix.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

The eight conclusions that follow are based on evidence collected in this study as related to freshmen pharmacy students at Ferris Institute for the school years 1958-59 and 1959-60. These conclusions, therefore, may or may not apply to pharmacy students at other colleges and universities and further experimentation is necessary for more positive validation.

Conclusion Number 1

The SVIB occupational groups produced significant differences among the pharmacy groups in 3 out of 78 tests.[1] On the basis of the data reported in this study, it therefore appears that the SVIB occupational groups are of limited value in differentiating among the pharmacy groups studied.

Conclusion Number 2

The SVIB Occupational Group VIII produced no significant differences among the pharmacy groups, nor did the SVIB Occupational Group VIII-A and VIII-B as two separate groups produce any significant differences among the

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[1]Table 4 on page 46 shows a total of 156 tests. However, there are half this number or 78 tests for each test appears twice in the table.

pharmacy groups. On the basis of the data reported in this study, it therefore appears that the SVIB Occupational Groups VIII-A and VIII-B as two separate groups do not serve to differentiate among the pharmacy groups any better than the SVIB Occupational Group VIII which combines these two groups.[1]

Conclusion Number 3

The SVIB Occupational Group X produced three significant differences in comparing Pharmacy Group 2 with the other pharmacy groups.[2] On the basis of the data reported in this study, it therefore appears that in comparison with students in the other pharmacy groups, a greater number of students in Pharmacy Group 2 have an interest in law, advertising, and writing.

Conclusion Number 4

The SVIB occupational groups produced no significant differences in comparing Pharmacy Groups 1 + 2 vs. Pharmacy Groups 3 + 4. On the basis of the data reported in this study, it therefore appears that the SVIB occupational groups do not differentiate between those pharmacy students

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[1]The SVIB Occupational Group VIII is composed of the Senior C.P.A., Accountant, Office Man, Purchasing Agent, Banker, Mortician and Pharmacist keys. The SVIB Occupational Group VIII-A is composed of the first five of the latter keys, and the SVIB Occupational Group VIII-B is composed of the Mortician and Pharmacist keys.

[2]The SVIB Occupational Group X is composed of the Advertising Man, Lawyer, and Author-Journalist keys.

who will earn a cumulative grade point average of 2.00 or above and those pharmacy students who will earn a cumulative grade point average below 2.00.

Conclusion Number 5

The SVIB occupational groups produced no significant differences in comparing Pharmacy Groups 1 + 3 vs. Pharmacy Groups 2 + 4. On the basis of the data reported in this study, it therefore appears that the SVIB occupational groups do not differentiate between pharmacy students who will continue the study of pharmacy and pharmacy students who will discontinue the study of pharmacy.

Conclusion Number 6

There was no significant difference between the mean grade point average for the students in Pharmacy Group 1 and the mean grade point average for the students in Pharmacy Group 2. On the basis of the data reported in this study, there is no valid evidence indicating that the students in Pharmacy Group 1 differ from the students in Pharmacy Group 2 in terms of academic achievement.

Conclusion Number 7

There was a significant difference between the mean grade point average for the students in Pharmacy Group 3 and the mean grade point average for the students in Pharmacy Group 4. On the basis of the data reported in this study, it therefore appears that the students in Pharmacy Group 3 differ from the students in Pharmacy Group 4 in terms of academic achievement.

Conclusion Number 8

There was a significant difference between the proportion of "D" and "E" grades earned by pharmacy students in the PSM courses and the proportion of "D" and "E" grades earned by pharmacy students in the Non-PSM courses for each of the pharmacy groups studied.[1] On the basis of the data reported in this study, it therefore appears that the PSM courses contribute more heavily to academic failure in terms of "D" and "E" grades than the Non-PSM courses for each of the pharmacy groups studied.

Recommendation Number 1

The author recommends further experimentation with the scores expressed by students on the Strong Vocational Interest Blank as a possible means for differentiating between successful and unsuccessful pharmacy students. Experimentation with larger student groups and also with students in other professional programs might result in findings which may improve the use of the SVIB in predicting academic success or failure.

Recommendation Number 2

The author recommends further study of the SVIB Occupational Group X which produced three significant differences between Pharmacy Group 2 and the other pharmacy groups. Further investigation of the SVIB Occupational Group X may improve the possibilities for identifying students who are

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[1]The abbreviation PSM courses means Pharmacy-Science-Mathematics courses, and the abbreviation Non-PSM courses means Non-Pharmacy-Science-Mathematics courses.

likely to maintain a cumulative grade point average above 2.00 but who discontinue the study of pharmacy.

Recommendation Number 3

Data obtained in 2 by 4 table tests showed that the SVIB Occupational Group VIII-A tended to differentiate Pharmacy Group 1 from the other pharmacy groups. However, the differences obtained in these tests by the SVIB Occupational Group VIII-A were based on estimated cell frequencies considerably below 5. Larger sample numbers might overcome these cell deficiencies encountered in a 2 by 4 table test. Therefore, further experimentation with the SVIB Occupational Group VIII-A (composed of the Senior C. P. A., Accountant, Office Man, Purchasing Agent, and Banker keys) and the SVIB Occupational Group VIII-B (composed of the Mortician and Pharmacist keys) as two separate groups is recommended as a possible means for identifying those students who are likely to succeed during their first two years in the pharmacy program.

Recommendation Number 4

Data obtained in 2 by 4 table tests showed that the SVIB Occupational Group IV tended to differentiate Pharmacy Group 2 from the other pharmacy groups. However, the differences obtained in these tests by the SVIB Occupational Group IV were based on estimated cell frequencies considerably below 5. Larger sample numbers might overcome these cell deficiencies encountered in a 2 by 4 table test.

Therefore, further experimentation with the SVIB Occupational Group IV (composed of the Farmer, Aviator, Carpenter, Printer, Mathematics-Physical Science Teacher, Industrial Arts Teacher, Vocational Agricultural Teacher, Policeman, and Forest Service Man keys) is recommended as a possible means for differentiating among the pharmacy groups.

Recommendation Number 5

There were significant differences between the proportion of "D" and "E" grades earned in the PSM courses and the proportion of "D" and "E" grades earned in the Non-PSM courses for each of the pharmacy groups studied. Therefore, further study of the PSM courses as they are related to academic success or failure in the pharmacy program is recommended. Further study of those courses which contribute more heavily to academic failure might aid in identifying students who are likely to succeed or fail during their first two years in the pharmacy program.

Recommendation Number 6

There was a significant difference between the students in Pharmacy Group 3 and the students in Pharmacy Group 4 as measured by the mean, cumulative grade point average for each group. Therefore, further study of the causes for this significant difference is recommended. Further knowledge about the causes for this significant difference might aid in identifying those pharmacy students who are likely to continue or discontinue the study of pharmacy.

Recommendation Number 7

Other studies which might be helpful in analyzing the causes of the high student mortality rate in the pharmacy program are also recommended. Among the studies that could be made, the following are recommended as representative of the type which might help to identify those students who are likely to succeed or fail in the pharmacy program:

1. A study of successful and unsuccessful pharmacy students as related to their scores on the Interest Maturity, Occupational Level, and Masculinity-Femininity scales of the SVIB.

2. A study of successful and unsuccessful pharmacy students as related to their scores on the American Council of Education Test.

3. A study of the possible differences between successful and unsuccessful pharmacy students as related to their entrance scores on chemistry, biology, physics, and mathematics tests.

4. A study of the reasons why pharmacy students discontinue the study of pharmacy.

5. A study of the interests of freshmen pharmacy students compared with their interests at graduation time.

6. A study of the interests and academic achievement of pharmacy students as related to their success or failure in the field.

7. A study of the interests and academic achievement of transfer pharmacy students compared with the

interests and academic achievement of non-transfer pharmacy students.

8. A study of the interests of successful and unsuccessful freshmen pharmacy students compared with interests expressed by successful pharmacists in the field.

9. A study of successful and unsuccessful pre-pharmacy students as related to their scores on the Strong Vocational Interest Blank.[1]

10. A study of the reasons why pharmacy is chosen as a profession.

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[1]Pre-pharmacy students are enrolled in the School of General Education rather than the School of Pharmacy because of their lack of preparation in high school.

APPENDICES

APPENDIX A

COPY OF THE STRONG VOCATIONAL INTEREST BLANK FOR MEN

Page 64--Score Sheet

Page 65--Instructions for Analyzing the Scores on the SVIB for Men

STRONG VOCATIONAL INTEREST TEST-MEN

HANKES REPORT FORM FOR—

SEE OTHER SIDE FOR EXPLANATION

NAME

AGENCY OR SCHOOL

AGE

DATE

NUMBER

GROUP	OCCUPATION	C	C+	B−	B	B+	A
	STANDARD SCALE	0 10 20	30		40	50	60 70
I	ARTIST						
	PSYCHOLOGIST (REV.)						
	ARCHITECT						
	PHYSICIAN (REV.)						
	OSTEOPATH						
	DENTIST						
	VETERINARIAN						
II	MATHEMATICIAN						
	PHYSICIST						
	ENGINEER						
	CHEMIST						
III	PRODUCTION MANAGER						
IV	FARMER						
	AVIATOR						
	CARPENTER						
	PRINTER						
	MATH. PHYS. SCI. TEACHER						
	IND. ARTS TEACHER						
	VOC. AGRICULT. TEACHER						
	POLICEMAN						
	FOREST SERVICE MAN						
V	Y.M.C.A. PHYS. DIRECTOR						
	PERSONNEL DIRECTOR						
	PUBLIC ADMINISTRATOR						
	Y.M.C.A. SECRETARY						
	SOC. SCI. H.S. TEACHER						
	CITY SCHOOL SUPT.						
	SOCIAL WORKER						
	MINISTER						
VI	MUSICIAN (PERFORMER)						
VII	C.P.A.						
VIII	SENIOR C.P.A.						
	ACCOUNTANT						
	OFFICE MAN						
	PURCHASING AGENT						
	BANKER						
	MORTICIAN						
	PHARMACIST						
IX	SALES MANAGER						
	REAL ESTATE SALESMAN						
	LIFE INSURANCE SALESMAN						
X	ADVERTISING MAN						
	LAWYER						
	AUTHOR-JOURNALIST						
XI	PRESIDENT-MFG. CONCERN						
	INTEREST MATURITY						
	OCCUPATIONAL LEVEL						
	MASCULINITY-FEMININITY	F					M
	STANDARD SCALE FOR IM, OL, MF	20	30		40	50	60 70

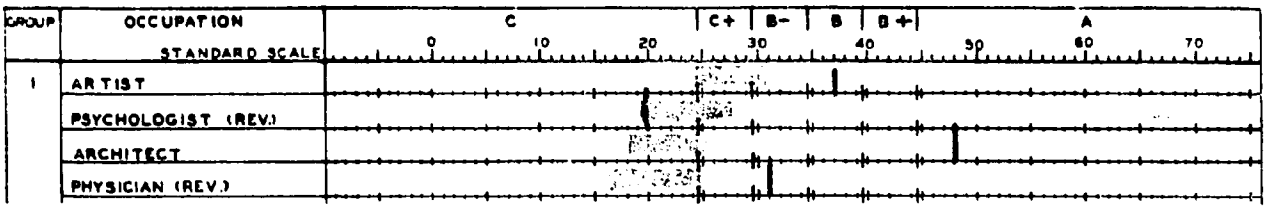
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Instructions for Analyzing the Scores on the Strong Vocational Interest Blank

Report on Vocational Interest Test for Men (Continued)

Your occupational interests are recorded by heavy lines on the scales opposite the appropriate occupations.

In the example below the man has a B rating in the interests of artists (note the B at the top of the report blank), a C rating in the interests of psychologists, an A rating in the interests of architects, and a B— rating in the interests of physicians.



An A rating means that the individual has the interests of persons successfully engaged in that occupation; a C rating means that the person does not have such interests; and the ratings B+, B, and B— mean that the person probably has those interests but we cannot be so sure of that fact as in the case of A ratings. It is seldom that persons with C ratings are found in the occupation, and if so engaged they are either indifferent successes who are likely to drop out or are carrying on the work in some more or less unusual manner. The latter situation is exemplified by a physician with a rating of C in the interests of a physician who is engaged as superintendent of a hospital.

All high ratings (B+ and A) should be considered. One may choose one occupation so rated or plan to utilize one's interests in two or more such occupations. Thus, if one scores high in both law and engineering one might prepare for both and become a patent attorney, or a lawyer specializing in engineering problems.

The higher a score to the right of the shaded area the greater the certainty that one has the interests characteristic of that occupation. The lower the score to the left of the shaded area the greater the certainty that one does not have the interests of the occupation. Scores falling within the shaded area are indeterminate: they help sometimes to show, along with other scores, the general trend of one's interests in an occupational group. But generally they can be ignored. Consequently, in the above diagram the scores for psychologist and physician are disregarded, and we conclude that the individual has an A rating in the interests of an architect and a B rating in the interests of an artist.

Occupations included in the same group all correlate highly with one another.

Men's interests change very little from 25 to 55 years of age. They change somewhat from 20 to 25 years and much more so from 15 to 20 years. Consequently, the younger the man, particularly below 20 years of age, the less certainly can his interests be identified in terms of some occupation. Such changes in interests as take place are more likely to result in higher ratings than the reverse. This is particularly true with respect to ratings in Group V.

The ratings from this test should not be viewed as conclusive; they are not guaranteed. Instead they should be viewed as merely suggestive and to be considered in the light of all other information bearing upon one's vocational choice. Occupations rated A and B+ should be carefully considered before definitely deciding against them; occupations rated C, C+, and B − should be carefully considered before definitely deciding to enter them. Remember only a few from among all the hundreds of occupations are reported on here.

Remember also this is a test of your interests. Your abilities must also be considered. Interests point the way you want to go, abilities determine how well you can progress.

Scores on the three special scales (see bottom of report sheet) are for the use of trained counselors and should be explained personally by them. The IM scale expresses maturity of interests. One's age must be taken into consideration in interpreting this score. It applies only to men between the ages of 15 and 20. The OL scale indicates whether one's interests are similar to common workmen (a low score) or to business and professional men (a high score). The MF scale indicates whether one's interests are similar to the interests of men or women. The average man scores 50 on the OL and MF scales. See the author's *Vocational Interests of Men and Women.*

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APPENDIX B

SUGGESTED CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

SUGGESTED CURRICULUM LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY[1]

First Year

First Quarter

	Quarter Hours
Orientation	1
Biology 121--General Biology	4
Chemistry 121--General Inorganic Chemistry 1	5
C.S. 101--Communication Skills 1	3
Math. 111--Fundamentals of Algebra	3
Pharmacy 151--Pharmacy Orientation 1	1
H. & P.E. 121 M or W--Health and Physical Ed.	1
	18

Second Quarter

Biol. 122--General Zoology	4
Chem. 122--General Inorganic Chemistry 2	5
C.S. 102--Communication Skills 2	3
Math. 121--College Algebra 1	4
Pharm 152--Pharmacy Orientation 2	1
H. & P.E. 122 M or W--Health and Physical Ed.	1
	18

Third Quarter

Biol. 123--General Botany	4
Chem. 123--Qualitative Chemistry	6
C.S. 103--Communication Skills 3	3
Math. 122--Trigonometry	3
Pharm. 153--Pharmacy Orientation 3	1
H. & P.E. 123 M or W--Health and Physical Ed.	1
	18
	54

Second Year

First Quarter

Pharm. 251--Pharmacy Arithmetic	4
Chem. 231--Quantitative Chemistry	5
Physics 221--General Physics 1	4
Chem. 221--Organic Chemistry 1	5
	18

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[1]Other requirements and regulations for receiving the Pharmacy degree appear on pages 110-14 of the Ferris Institute catalog for the school year 1958-59. The suggested curriculum for the school year 1959-60 is also the same as the one for the preceding year.

Second Quarter	Quarter Hours
Econ. 221--Elementary Economics	4
Physics 222--General Physics 2.	4
Chem. 222--Organic Chemistry 2.	5
Biol. 221--Anatomy and Physiology 1	4
	17

Third Quarter

Physics 223--General Physics 3.	4
Chem. 223--Organic Chemistry 3.	5
Biol. 222--Anatomy and Physiology 2	4
Psych. 221--Introductory General Psychology	3
	16
	51

Third Year

First Quarter

Pharm. 351--Operative Pharmacy 1.	4
Pharm. Ad.--Marketing of Drug Products.	3
Ph. Chem. 311--Inorganic Pharmaceutical Chemistry	4
Pcog. 331--Pharmacognosy 1.	4
Biol. 321--Bacteriology 1	3
	18

Second Quarter

Pharm. 352--Operative Pharmacy 2.	5
Pharm. Ad. 342--Retail Pharmacy Management 1.	3
Pcog. 332--Pharmacognosy 2.	4
Biol. 322--Bacteriology 2	3
Biol. 331--First Aid.	1
Pol. Sci. 121--Principles of American Government 1.	3
	19

Third Quarter

Pharm. 353--Operative Pharmacy 3.	5
Pharm. Ad. 343--Retail Pharmacy Management 2.	3
Ph. Chem. 211--Drug Assay	5
Biol. 323--Bacteriology 3	3
Pol. Sci. 122--Principles of American Government 2.	3
	19
	56

Fourth Year

First Quarter

Pharm. 451--Prescriptions 1	4
Pcol. 421--Pharmacology 1	4
Chem. 321--Biochemistry 1	5
Pharm. Ad. 441--Pharmacy Law.	4
	17

Second Quarter	Quarter Hours
Pharm. 452--Prescriptions 2	4
Pcol. 422--Pharmacology 2	4
Ph. Chem. 412--Organic Pharmaceutical Chemistry 1 .	5
Pharm. Ad. 442--Pharmacy Accounting	4
	17
Third Quarter	
Pharm. 453--Prescriptions 3	4
Pcol. 423--Pharmacology 3	4
Ph. Chem. 413--Organic Pharmaceutical Chemistry 2 .	5
Biol. 431--Public Health and Sanitation	3
	16
	50
	211

APPENDIX C

DISTRIBUTION OF "A", "B", AND "C" GRADES FOR FOUR PHARMACY GROUPS FOR THE COMBINED SCHOOL YEARS 1958-59 AND 1959-60 WITH REFERENCE TO SEVENTY-ONE SELECTED COURSES

TABLE 11--Distribution of "A", "B", and "C" grades for four Pharmacy groups for the combined School Years 1958-59 and 1959-60 with reference to seventy-one selected courses[1]

Course Description and Number	Group 1				Group 2				Group 3				Group 4				Com. Tot. for All Four Phar. Groups	
	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	Total No.	Per Cent of Total
Acct. 121	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	.04
Biol. 121	8	18	16	42	2	7	11	20	1	3	11	15	1	4	21	26	103	4.13
Biol. 122	10	15	17	42	5	5	5	15	0	3	13	16	2	7	25	34	107	4.29
Biol. 123	7	19	15	41	3	4	2	9	0	2	7	9	0	3	9	12	71	2.85
Biol. 124	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Biol. 221	7	19	16	42	0	0	3	3	0	5	11	16	0	1	9	10	71	2.85
Biol. 222	7	15	15	37	0	0	2	2	0	4	5	9	1	2	1	4	52	2.08
Biol. 301	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	.04
Biol. 305	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	.04
Biol. 331	1	0	0	1	1	0	0	1	0	1	0	1	0	0	0	0	3	.12
Biol. 452	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	.04
Bio. Sci. 101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	.04
Chem. 121	8	24	7	39	2	5	5	12	0	3	11	14	0	4	23	27	92	3.69
Chem. 122	6	14	13	33	1	2	5	8	1	0	5	6	0	2	14	16	63	2.53
Chem. 123	8	21	14	43	0	5	7	12	0	4	9	13	0	10	13	23	91	3.65
Chem. 131	1	4	4	9	0	2	5	7	0	2	3	5	0	5	14	19	40	1.60
Chem. 132	0	2	6	8	0	1	6	7	0	0	2	2	0	1	20	21	38	1.52
Chem. 133	0	4	5	9	0	1	2	3	0	0	4	4	0	0	7	7	23	.92
Chem. 221	2	9	19	30	0	1	0	1	0	2	3	5	0	0	4	4	40	1.60
Chem. 222	3	8	19	30	0	1	0	1	0	0	4	4	0	0	0	0	35	1.40

TABLE 11--Continued

Course Description and Number	Group 1				Group 2				Group 3				Group 4				Com. Tot. for All Four Phar. Groups	
	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	Total No.	Per Cent of Total
Chem. 223	2	7	15	24	0	1	0	1	0	0	2	2	0	0	2	2	29	1.16
Chem. 231	3	12	12	27	0	1	0	1	0	0	5	5	0	0	0	0	33	1.32
C.S. 101	2	25	11	38	2	6	6	14	0	4	5	9	1	7	26	34	95	3.81
C.S. 102	9	23	6	38	2	6	5	13	0	6	5	11	1	12	16	29	91	3.65
C.S. 103	10	21	11	42	1	7	3	11	1	6	4	11	1	10	12	23	87	3.49
C.S. 101R	0	4	4	8	0	6	2	8	0	3	4	7	0	3	22	25	48	1.92
C.S. 102R	0	6	2	8	1	4	1	6	0	4	4	8	1	6	13	20	42	1.68
C.S. 103R	1	1	3	5	0	1	1	2	1	1	3	5	1	5	13	19	31	1.24
Com. 121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	.04
Com. 122	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	.04
Econ. 221	13	15	14	42	2	2	2	6	3	6	6	15	3	7	9	19	82	3.29
Econ. 222	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	.04
Hum. 101	1	0	0	1	0	0	0	0	0	1	1	2	0	0	0	0	3	.12
Hum. 115	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Law 221	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	.04
Math. 111	3	6	0	9	3	7	1	11	0	2	5	7	2	8	16	26	53	2.12
Math. 121	10	22	14	46	3	7	10	20	1	6	8	15	3	17	29	49	130	5.21
Math. 122	10	23	9	42	4	2	7	13	1	3	7	11	4	5	27	36	102	4.09
Math. 123	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Math. 221	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Music 121	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Music 221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	.04
Music 251	5	0	1	6	0	0	0	0	1	0	0	1	3	0	0	3	10	.40

TABLE 11--Continued

Course Description and Number	Group 1				Group 2				Group 3				Group 4				Com. Tot. for All Four Phar. Groups	
	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	Total No.	Per Cent of Total
Music 254	6	0	0	6	0	0	0	0	3	0	0	3	0	0	0	0	9	.36
Music 261	8	0	0	8	0	0	0	0	0	0	0	0	4	0	0	4	12	.48
Music 262	13	2	1	16	2	0	0	2	0	0	0	0	0	1	0	1	19	.76
P.C. 211	1	3	0	4	0	0	0	0	0	0	1	1	0	0	0	0	5	.20
Phar. Chem. 311	0	1	1	2	1	0	0	1	0	2	0	2	0	0	2	2	7	.28
Phar. Ad. 341	0	10	4	14	0	0	2	2	0	1	0	1	0	1	0	1	18	.72
Phar. Ad. 342	2	2	2	6	0	1	1	2	0	0	0	0	0	0	2	2	10	.40
Phar. Ad. 343	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3	.12
Phar. Ad. 441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	.04
Phar. Ad. 442	0	1	1	2	1	2	0	3	0	1	0	0	0	1	0	1	7	.28
Phar. 151	11	30	6	47	1	16	8	25	2	16	0	18	0	26	40	66	156	6.25
Phar. 152	18	26	3	47	5	13	1	19	5	10	5	20	5	30	20	55	141	5.65
Phar. 153	9	16	12	37	1	1	12	14	0	4	12	16	1	1	25	27	94	3.77
Phar. 251	10	18	12	40	1	0	0	1	0	3	6	9	1	1	8	10	60	2.40
Phar. 351	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	.04
Phar. 352	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	.04
Physics 221	1	7	10	18	0	0	2	2	0	2	3	5	0	0	2	2	27	1.08
Physics 222	1	11	15	27	0	0	2	2	0	1	5	6	0	0	2	2	37	1.48
Physics 223	2	7	7	16	0	0	0	0	0	0	2	2	0	0	1	1	19	.76
Pol.Sci. 121	8	18	14	40	1	3	5	9	0	5	4	9	0	3	14	17	75	3.01
Pol.Sci. 122	5	10	6	21	0	0	0	0	0	2	4	6	0	1	4	5	32	1.28
Psy. 221	6	12	11	29	1	4	3	8	1	5	6	12	0	6	5	11	60	2.40
Psy. 222	2	1	1	4	0	0	1	1	0	0	0	0	0	0	0	0	5	.20

TABLE 11--Continued

Course Description and Number	Group 1				Group 2				Group 3				Group 4				Com. Tot. for All Four Phar. Groups	
	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	A	B	C	Com. Tot.	Total No.	Per Cent of Total
Soc. Sci. 101	0	1	0	1	0	0	0	0	0	0	1	1	0	0	2	2	4	.16
Sociology 221	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	.04
Speech 121	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	2	.08
Speech 221	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1	3	.12
Speech 224	2	0	0	2	0	2	1	3	0	0	0	0	1	0	0	1	6	.24
Totals	246	378		515	48	132		127	21	197		124	37	477		193	2495	100.00
				1139				307				342				707		

[1]The following four courses were omitted from this table: Continuing Orientation for one quarter hour of credit, Bowling for ½ quarter hour of credit, Health Education for ½ quarter hour of credit, and Physical Education for ½ quarter hour of credit. Continuing Orientation was excluded because in 1958-59 the student was simply given credit for the course without any grade designation, and the latter three courses were excluded because they carried less than one quarter hour of credit.

APPENDIX D

DISTRIBUTION OF "D" AND "E" GRADES FOR FOUR PHARMACY GROUPS FOR THE COMBINED SCHOOL YEARS 1958-59 AND 1959-60 WITH REFERENCE TO FIFTY-TWO SELECTED COURSES

TABLE 12--Distribution of "D" and "E" grades for four Pharmacy groups for the combined School Years 1958-59 and 1959-60 with reference to fifty-two selected courses[1]

Course Description and Number	Group 1			Group 2			Group 3			Group 4			Combined Total for All Four Pharmacy Groups	
	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	Total No.	Per Cent of Total
Acct. 121	0	0	0	0	0	0	1	0	1	0	0	0	1	.11
Biol. 121	6	1	7	4	1	5	5	4	9	40	20	60	81	9.28
Biol. 122	4	0	4	2	0	2	3	0	3	18	11	29	38	4.35
Biol. 123	4	0	4	3	0	3	6	0	6	13	8	21	34	3.89
Biol. 124	0	0	0	0	0	0	0	0	0	1	0	1	1	.11
Biol. 221	4	0	4	0	1	1	2	0	2	4	3	7	14	1.60
Biol. 222	1	0	1	0	0	0	3	0	3	5	0	5	9	1.03
Biol. 321	0	0	0	0	0	0	0	0	0	0	1	1	1	.11
Chem. 121	1	0	1	3	0	3	0	0	0	14	9	23	27	3.09
Chem. 122	4	1	5	4	0	4	7	2	9	14	14	28	46	5.27
Chem. 123	4	0	4	1	0	1	4	0	4	7	3	10	19	2.18
Chem. 131	0	2	2	1	0	1	1	0	1	10	11	21	25	2.86
Chem. 132	1	0	1	0	1	1	4	0	4	4	4	8	14	1.60
Chem. 133	0	0	0	2	0	2	1	1	2	5	6	11	15	1.72
Chem. 221	14	5	19	2	2	4	9	10	19	10	16	26	68	7.79
Chem. 222	6	6	12	0	0	0	2	2	4	3	11	14	30	3.44
Chem. 223	6	0	6	0	0	0	2	0	2	1	0	1	9	1.03
Chem. 231	5	2	7	1	0	1	6	1	7	2	4	6	21	2.41
C.S. 101	0	0	0	2	0	2	2	0	2	8	7	15	19	2.18
C.S. 102	1	0	1	1	0	1	0	0	0	4	2	6	8	.92
C.S. 103	0	0	0	0	0	0	0	0	0	0	1	1	1	.11

TABLE 12--Continued

Course Description and Number	Group 1			Group 2			Group 3			Group 4			Combined Total for All Four Pharmacy Groups	
	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	Total No.	Per Cent of Total
C.S. 101 R	0	0	0	0	0	0	3	0	3	9	2	11	14	1.60
C.S. 102 R	0	0	0	0	0	0	2	0	2	6	1	7	9	1.03
C.S. 103 R	0	0	0	0	0	0	1	1	2	1	1	2	4	.46
Econ. 221	2	0	2	0	0	0	1	2	3	6	4	10	15	1.72
French 121	0	0	0	1	0	1	0	0	0	0	0	0	1	.11
Hist. 121	0	0	0	0	0	0	1	0	1	0	0	0	1	.11
Hist. 123	0	0	0	0	0	0	0	0	0	0	1	1	1	.11
Hist. 232	0	0	0	0	0	0	0	0	0	0	1	1	1	.11
Hum. 101	0	0	0	0	0	0	0	0	0	2	0	2	2	.23
Hum. 102	0	0	0	0	0	0	0	0	0	1	0	1	1	.11
Math. 111	0	1	1	0	0	0	0	1	1	6	6	12	14	1.60
Math 121	2	2	4	2	0	2	4	3	7	19	13	32	45	5.15
Math. 122	5	2	7	1	1	2	8	3	11	10	10	20	40	4.58
Phar. Ad. 341	0	0	0	0	0	0	1	0	1	0	1	1	2	.23
Phar. Ad. 343	1	0	1	0	0	0	0	0	0	0	0	0	1	.11
Phar. Ad. 442	0	0	0	0	0	0	0	0	0	2	0	2	2	.23
Ph. Chem. 311	0	0	0	0	0	0	0	0	0	2	1	3	3	.34
P.H.P. 101	0	0	0	0	0	0	0	0	0	1	0	1	1	.11
Phar. 151	1	0	1	0	0	0	2	0	2	6	4	10	13	1.49
Phar. 152	1	0	1	0	1	1	0	0	0	7	1	8	10	1.15
Phar. 153	8	0	8	1	0	1	4	0	4	18	7	25	38	4.35
Phar. 251	5	3	8	2	1	3	5	5	10	7	10	17	38	4.35
Phar. 351	0	0	0	0	0	0	1	0	1	1	0	1	2	.23

TABLE 12--Continued

Course Description and Number	Group 1			Group 2			Group 3			Group 4			Combined Total for All Four Pharmacy Groups	
	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	D	E	Comb. Total	Total No.	Per Cent of Total
Physics 221	24	5	29	2	2	4	6	6	12	11	17	28	73	8.36
Physics 222	8	3	11	1	0	1	2	0	2	4	2	6	20	2.29
Physics 223	9	1	10	1	0	1	0	0	0	1	2	3	14	1.60
Pol. Sci. 121	1	0	1	1	0	1	3	0	3	8	1	9	14	1.60
Pol. Sci. 122	0	0	0	0	0	0	0	0	0	2	0	2	2	.23
Psych. 221	1	1	2	0	0	0	0	0	0	5	2	7	9	1.03
Psych. 222	0	0	0	0	0	0	0	0	0	0	1	1	1	.11
Soc. 221	0	0	0	0	0	0	0	0	0	1	0	1	1	.11
Totals	129	35	164	38	10	48	102	41	143	299	219	518	873	

[1]The five other grade designations of WP, withdrew passing; W, withdrew; A, audit; INC., incomplete; and U, unsatisfactory, were omitted from this table because they are not used in computing the grade point average.

APPENDIX E

LISTING OF COURSE ABBREVIATIONS AND THEIR RESPECTIVE DESCRIPTIONS AND QUARTER HOURS OF CREDIT

TABLE 13--Listing of Course Abbreviations and their Respective Descriptions and Quarter Hours

Course Abbreviation	Course Description	Quarter Hours
Acct. 121	Accounting 121. Principles of Accounting 1.	4
Biol. 121	Biology 121. General Biology	4
Biol. 122	Biology 122. General Zoology	4
Biol. 123	Biology 123. General Botany.	4
Biol. 124	Biology 124. General Zoology 2.	4
Biol. 221	Biology 221. Anatomy and Physiology 1	4
Biol. 222	Biology 222. Anatomy and Physiology 2	4
Biol. 301	Biology 301. Genetics.	3
Biol. 305	Biology 305. Organic Evolution.	3
Biol. 321	Biology 321. Bacteriology 1.	3
Biol. 331	Biology 331. First Aid	1
Biol. 452	Biology 452. Special Problems in Biology	1-4
Bio. Sci. 101	Biological Science 101. The Living World 1	4
Chem. 121	Chemistry 121. General Inorganic Chemistry 1	5
Chem. 122	Chemistry 122. General Inorganic Chemistry 2	5
Chem. 123	Chemistry 123. Qualitative Analysis	6
Chem. 131	Chemistry 131. Introductory Inorganic Chemistry 1	4
Chem. 132	Chemistry 132. Introductory Inorganic Chemistry 2	4
Chem. 133	Chemistry 133. General Chemistry: Mathematical Applications.	2
Chem. 221	Chemistry 221. Organic Chemistry 1	5
Chem. 222	Chemistry 222. Organic Chemistry 2	5
Chem. 223	Chemistry 223. Organic Chemistry 3	5
Chem. 231	Chemistry 231. Quantitative Chemistry 1.	5
Com. 121	Commerce 121. Business Mathematics	4
Com. 122	Commerce 122. Business Organization	4

TABLE 13--Continued

Course Abbreviation	Course Description	Quarter Hours
C. S. 101 R	Communication Skills 1 (Remedial)	3
C. S. 102 R	Communication Skills 2 (Remedial)	3
C. S. 103 R	Communication Skills 3 (Remedial)	3
C. S. 101	Communication Skills 1	3
C. S. 102	Communication Skills 2	3
C. S. 103	Communication Skills 3	3
Econ. 221	Economics 221. Elementary Economics	4
Econ. 222	Economics 222. Advanced Economics	4
French 121	French 121. Beginning French 1.	4
Hist. 121	History 121. American History (1492-1840)	3
Hist. 123	History 123. American History (1900 to date)	3
Hist. 232	History 232. U. S. Social and Intellectual History Since 1865	3
Hum. 101	Humanities 101. Personal and Cultural Appreciation 1	3
Hum. 102	Humanities 102. Personal and Cultural Appreciation 2	3
Hum. 115	Humanities 115. Introduction to Philosophy	3
Law 221	Law 221. Elementary Business Law	4
Math 111	Mathematics 111. Fundamentals of Algebra	3
Math 121	Mathematics 121. College Algebra 1	4
Math 122	Mathematics 122. Trigonometry	3
Math 123	Mathematics 123. College Algebra 2	3
Math 221	Mathematics 221. Plane Analytic Geometry	4
Music 121	Music 121. Fundamentals of Music	2
Music 221	Music 221. Music Appreciation	3
Music 251	Music 251. Crimson and Gold Chorus	1
Music 254	Music 254. Men's Glee Club	1
Music 261	Music 261. Marching Band	2
Music 262	Music 262. Concert Band	1

TABLE 13--Continued

Course Abbreviation	Course Description	Quarter Hours
Phar. 151	Pharmacy 151. Pharmacy Orientation	1
Phar. 152	Pharmacy 152. Pharmacy Orientation	2
Phar. 153	Pharmacy 153. Pharmacy Orientation	3
Phar. 251	Pharmacy 251. Pharmacy Arithmetic	4
Phar. 351	Pharmacy 351. Operative Pharmacy 1	4
Phar. 352	Pharmacy 352. Operative Pharmacy 2	5
Phar. Ad. 341	Pharmacy Administration 341. Marketing of Drug Products	3
Phar. Ad. 342	Pharmacy Administration 342. Retail Pharmacy Management 1	3
Phar. Ad. 343	Pharmacy Administration 343. Retail Pharmacy Management 2	3
Phar. Ad. 441	Pharmacy Administration 441. Pharmacy Law	4
PC 211	Pharmaceutical Chemistry 211. Drug Assay	5
Phar. Chem. 311	Pharmaceutical Chemistry 311. Inorganic Pharmaceutical Chemistry	4
Physics 221	Physics 221. General Physics 1	4
Physics 222	Physics 222. General Physics 2	4
Physics 223	Physics 223. General Physics 2	4
Pol. Sci. 121	Political Science 121. Principles of American Government 1	3
Pol. Sci. 122	Political Science 122. Principles of American Government 2	3
Psy. 221	Psychology 221. Introductory General Psychology	3
Psy. 222	Psychology 222. Advanced General Psychology	3
P.H.P. 101	Public Health Practices 1.	3
Sociology 221	Sociology 221. Introductory Sociology	4
Soc. Sci. 101	Social Science 101. Man and Society 1	3
Speech 121	Speech 121. Fundamentals of Speaking	4
Speech 221	Speech 221. Group Discussion Procedures	2
Speech 224	Speech 224. Applied Dramatics	2

APPENDIX F

DISTRIBUTION OF PRIMARY, SECONDARY, NEUTRAL, AND REJECT SCORES FOR EACH CASE FOR FOUR PHARMACY GROUPS

TABLE 14.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 1 for the school year 1958-59

Case Number	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1	S	S	S	S	R	R	N	S	N	P	N	R	S
2	N	N	R	N	S	S	S	S	S	S	S	R	N
3	S	S	P	N	N	R	N	S	N	P	S	R	P
4	P	P	S	S	R	S	N	N	N	R	R	N	N
5	P	N	R	N	R	N	N	N	N	S	N	S	N
6	N	R	N	N	N	R	N	N	N	S	P	N	N
7	S	S	N	N	N	N	N	N	N	N	N	R	S
8	N	N	N	R	N	N	P	S	S	S	N	N	S
9	S	S	S	P	N	P	N	S	S	R	R	R	R
10	S	S	S	S	R	N	R	N	N	P	S	R	P
11	N	S	P	P	N	N	R	S	S	N	N	R	N
12	N	N	R	N	N	S	N	N	N	N	N	N	N
13	N	R	N	R	S	R	S	P	S	P	S	N	S
14	S	N	N	N	R	R	S	N	N	P	P	S	P
15	N	R	N	R	N	N	S	N	N	P	P	S	S
P	2	1	2	2	0	1	1	1	0	6	3	0	3
Interest S	6	6	4	3	2	3	4	6	5	4	4	3	5
Pattern N	7	5	6	7	8	6	8	8	10	3	6	5	6
Totals R	0	3	3	3	5	5	2	0	0	2	2	7	1

TABLE 15.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 1 for the school year 1959-60

Case Number	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1	P	P	S	N	S	P	S	N	N	N	R	N	N
2	S	P	N	S	N	P	N	N	N	P	R	N	S
3	S	S	N	S	R	N	N	P	S	P	R	R	N
4	N	R	N	S	S	N	N	P	P	P	S	R	N
5	S	S	P	P	N	S	R	S	N	P	N	R	P
6	N	N	N	N	S	P	N	S	S	S	N	R	R
7	N	P	P	S	R	N	N	S	N	P	R	R	P
8	S	P	N	P	R	N	N	N	N	N	N	R	N
9	N	S	N	N	N	P	S	S	S	S	N	N	P
10	S	P	S	P	N	P	N	N	N	P	R	R	N
11	N	P	P	S	R	R	N	S	S	S	R	R	S
12	N	N	S	N	N	N	S	S	S	P	S	R	P
13	R	R	R	R	R	N	N	N	N	P	P	N	P
14	S	N	S	P	N	P	N	N	N	P	R	R	N
15	N	R	N	N	P	P	N	S	S	P	N	N	R
16	N	S	N	N	N	S	S	N	N	S	N	N	N
17	N	S	N	N	R	P	P	S	P	N	R	R	N
18	R	R	P	R	N	N	S	P	S	P	P	N	P
19	N	S	N	N	R	P	S	P	S	P	S	N	P
20	S	S	P	P	S	P	N	N	N	S	R	R	N
21	N	R	P	N	P	S	S	S	S	S	P	N	S
22	N	N	R	N	R	S	S	N	N	S	N	N	N
23	S	S	N	N	R	P	N	N	N	P	N	N	P
24	S	S	N	P	S	S	S	S	P	N	R	R	R
25	N	P	S	N	N	S	N	S	S	P	N	R	P
26	N	S	S	N	R	N	N	P	S	P	R	R	P
27	N	R	R	N	N	P	R	S	S	S	N	N	R
28	S	N	S	S	N	S	N	S	S	P	N	R	P
29	S	S	R	S	N	P	N	R	R	R	R	R	R
30	S	N	P	N	N	S	N	N	N	P	P	S	P
31	N	S	S	S	R	R	S	S	S	S	R	R	P
32	N	S	N	N	R	N	N	S	S	S	R	R	S
33	S	S	N	N	N	N	P	S	S	S	R	N	S
P	1	7	7	6	2	13	2	4	3	17	4	0	13
Interest S	13	14	8	8	5	8	10	17	16	11	3	1	5
Pattern N	17	6	14	17	14	10	19	11	13	4	11	13	10
Totals R	2	6	4	2	12	2	2	1	1	1	15	19	5

TABLE 16.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 1 for the combined school years 1958-59 and 1959-60

Combined Interest Pattern Totals	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
Primary	3	8	9	8	2	14	3	5	3	23	7	0	16
Secondary	19	20	12	11	7	11	14	23	21	15	7	4	10
Neutral	24	11	20	24	22	16	27	19	23	7	17	18	16
Reject	2	9	7	5	17	7	4	1	1	3	17	26	6

TABLE 17.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 2 for the school year 1958-59

Case Number		Strong Occupational Group Number												
		1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1		S	N	N	R	N	P	N	N	R	P	S	S	P
2		P	P	S	R	R	N	S	R	R	P	N	S	P
3		N	R	N	R	P	R	S	P	P	P	S	R	R
4		N	R	N	R	S	S	N	S	S	P	P	N	N
5		R	R	N	N	R	R	N	P	P	P	P	R	P
6		N	R	N	R	R	R	P	S	S	S	P	S	S
7		N	N	S	P	S	N	R	N	S	R	R	R	R
8		N	N	R	R	R	N	P	N	N	S	P	P	P
9		R	N	N	N	R	N	N	P	P	P	P	N	N
10		S	P	P	N	R	N	N	N	N	P	N	N	P
11		S	P	S	N	R	R	P	N	S	R	R	N	S
	P	1	3	1	1	1	1	3	3	3	7	5	1	5
Interest	S	3	0	3	0	2	1	2	2	4	2	2	3	2
Pattern	N	5	4	6	4	1	5	5	5	2	0	2	4	2
Totals	R	2	4	1	6	7	4	1	1	2	2	2	3	2

TABLE 18.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 2 for the school year 1959-60

Case Number		Strong Occupational Group Number												
		1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1		N	S	S	N	R	N	S	S	S	O	N	R	P
2		N	N	R	N	N	N	N	N	N	R	N	S	N
3		N	S	P	S	N	N	N	P	P	P	N	R	S
4		S	S	S	P	N	P	N	S	S	S	R	R	R
5		N	R	N	R	S	R	S	N	N	P	P	P	P
6		N	S	S	P	S	P	N	N	N	P	P	P	P
7		P	S	R	R	R	P	S	R	R	N	N	P	P
8		S	P	S	R	S	P	S	N	N	P	N	S	P
9		R	R	N	N	S	N	S	P	S	P	P	N	S
10		S	S	R	N	R	N	P	S	S	S	R	S	S
11		N	N	S	S	N	P	R	N	N	P	R	R	P
12		S	S	N	N	S	P	N	N	N	P	N	N	P
13		R	R	P	S	P	N	N	P	P	P	S	R	P
14		R	R	P	P	N	N	N	P	P	P	P	R	P
	P	1	1	3	3	1	6	1	4	4	9	3	2	8
Interest	S	4	7	5	3	5	0	5	4	4	3	1	3	3
Pattern	N	6	2	3	5	5	7	7	5	5	1	6	2	1
Totals	R	3	4	3	3	3	1	1	1	1	1	4	7	2

TABLE 19.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 2 for the combined school years 1958-59 and 1959-60

Combined Interest Pattern Totals	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
Primary	2	4	4	4	2	7	4	7	7	16	8	3	13
Secondary	7	7	8	3	7	1	7	6	8	5	3	6	5
Neutral	11	6	9	9	6	12	12	10	7	1	8	6	3
Reject	5	8	4	9	10	5	2	2	3	3	6	10	4

TABLE 20.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 3 for the school year 1958-59

Case Number		Strong Occupational Group Number												
		1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1		N	P	N	S	R	N	N	N	N	S	R	R	N
2		N	R	P	N	N	R	R	S	N	P	P	R	P
3		P	N	N	S	S	P	N	S	S	P	R	R	N
4		P	P	N	N	R	N	N	R	R	P	N	N	P
5		N	R	S	N	P	R	S	P	S	P	P	R	S
6		S	S	N	N	R	S	S	S	S	P	N	N	N
	P	2	2	1	0	1	1	0	1	0	5	2	0	2
Interest	S	1	1	1	2	1	1	2	3	3	1	0	0	1
Pattern	N	3	1	4	4	1	2	3	1	2	0	2	2	3
Totals	R	0	2	0	0	3	2	1	1	1	0	2	4	0

TABLE 21.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 3 for the school year 1959-60

Case Number		Strong Occupational Group Number												
		1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1		S	N	P	P	P	P	S	P	P	P	N	R	S
2		N	N	S	N	N	R	N	S	S	P	N	R	P
3		S	P	N	P	N	S	R	S	S	S	R	R	N
4		S	P	S	S	R	S	N	S	S	P	N	R	P
5		S	N	N	N	N	P	N	P	S	P	S	N	N
6		S	S	R	N	N	P	N	N	R	S	N	N	S
7		N	N	R	N	S	N	N	S	S	S	N	R	N
8		N	N	R	P	R	N	N	N	S	N	R	R	N
9		N	R	S	N	S	P	S	P	P	P	P	N	P
10		N	N	R	S	R	N	N	N	N	P	S	R	S
11		N	R	R	R	R	R	P	N	N	P	P	P	P
12		N	R	P	S	S	N	N	S	S	P	P	R	S
13		N	S	N	N	N	R	P	P	P	P	R	R	S
14		N	S	P	N	N	P	N	S	N	P	N	N	P
	P	0	2	3	3	1	5	2	4	3	10	3	1	5
Interest	S	5	3	3	3	3	2	2	6	7	3	2	0	5
Pattern	N	9	6	3	7	6	4	9	4	3	1	6	4	4
Totals	R	0	3	5	1	4	3	1	0	1	0	3	9	0

TABLE 22.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 3 for the combined school years 1958-59 and 1959-60

Combined Interest Pattern Totals	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
Primary	2	4	4	3	2	6	2	5	3	15	5	1	7
Secondary	6	4	4	3	4	3	4	9	10	4	2	0	6
Neutral	12	7	7	11	7	6	12	5	5	1	8	6	7
Reject	0	5	5	1	7	5	2	1	2	0	5	13	0

TABLE 23.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 4 for the school year 1958-59

Case Number	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1	N	N	N	R	R	R	S	N	N	P	P	S	P
2	P	P	P	P	S	P	N	N	N	N	R	R	N
3	N	N	N	N	S	P	S	S	N	S	S	P	N
4	N	R	S	N	N	N	R	S	N	P	P	R	S
5	N	S	P	N	R	R	P	P	P	P	S	R	P
6	S	N	N	R	N	P	S	N	N	P	P	P	P
7	R	R	S	R	N	R	P	P	P	P	P	R	P
8	S	S	S	N	R	N	N	N	N	P	N	N	S
9	N	N	S	R	R	R	N	P	S	P	P	R	P
10	P	S	S	N	R	S	N	N	R	P	N	N	P
11	S	N	N	N	R	R	R	R	R	P	N	N	S
12	S	S	P	P	S	S	R	N	N	S	R	R	R
13	N	R	N	S	S	P	R	S	S	S	N	R	N
14	P	S	N	N	R	N	N	N	R	P	N	N	S
15	N	N	S	N	N	R	N	N	R	P	P	R	P
16	N	S	R	S	N	N	N	S	S	P	R	R	N
17	N	N	S	S	N	N	R	S	S	P	S	R	N
18	P	S	N	P	N	P	R	N	N	P	R	R	R
19	N	R	R	N	P	P	R	S	N	S	P	N	R
20	S	N	R	S	N	N	N	N	N	P	S	N	R
21	N	S	N	N	R	N	S	N	N	S	S	S	S
22	S	S	R	N	N	P	S	N	N	P	N	N	N
23	N	N	S	N	P	R	P	S	S	S	P	R	S
24	N	S	S	R	N	R	S	N	N	P	S	N	P
25	N	R	N	S	S	N	R	P	P	P	P	R	R
26	P	S	S	S	R	N	R	N	N	S	R	R	S
27	N	N	R	N	R	N	S	S	N	P	S	N	S
28	N	S	P	S	P	N	S	S	P	S	N	R	N
29	S	P	P	S	R	N	R	S	N	P	R	R	S
30	S	S	N	N	R	N	S	N	N	N	N	N	P
31	R	N	R	N	R	R	N	N	N	S	P	R	S
32	N	S	S	N	N	N	N	N	N	P	N	R	N
33	R	N	N	R	R	R	P	S	S	S	P	N	S
34	N	R	P	N	S	S	N	P	P	P	N	R	S
35	S	N	N	R	S	P	S	N	N	P	S	P	S
36	R	N	P	N	S	R	P	P	P	R	N	R	S
37	S	N	N	S	R	S	N	N	N	N	N	N	N
38	N	S	P	N	R	R	N	P	P	P	N	R	S
39	N	R	P	S	P	N	S	P	P	P	N	R	N
40	S	N	N	P	S	S	N	P	P	P	N	R	R
41	S	S	N	N	R	N	N	S	N	P	S	N	S
P	5	2	9	4	4	8	5	9	9	27	11	3	9
Interest S	12	16	11	10	9	5	11	12	6	10	9	2	16
Pattern N	20	16	15	20	11	16	15	19	22	3	15	13	10
Total R	4	7	6	7	17	12	10	1	4	1	6	23	6

TABLE 24.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 4 for the school year 1959-60

Case Number	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
1	N	S	P	R	R	N	S	S	N	P	S	N	P
2	S	P	N	N	R	R	N	N	R	S	N	N	P
3	N	N	S	N	N	R	N	P	S	P	N	N	P
4	P	S	R	P	R	N	R	N	R	S	N	N	N
5	N	N	P	N	S	P	S	P	P	P	P	R	S
6	N	S	N	P	R	R	R	N	N	R	R	R	N
7	S	N	N	S	S	N	R	S	N	S	N	R	N
8	N	R	R	N	S	S	S	S	N	N	N	S	S
9	N	R	S	S	N	N	N	P	S	P	P	R	N
10	S	R	P	R	P	P	S	S	S	S	P	N	P
11	N	S	P	N	R	R	R	N	N	P	S	R	P
12	N	N	N	N	R	P	S	N	N	P	N	P	P
13	N	P	P	N	S	P	S	S	S	N	R	N	R
14	N	R	S	N	S	N	N	S	S	S	N	R	P
15	N	N	N	N	R	P	N	N	N	P	P	N	P
16	R	R	R	N	S	P	N	S	S	P	S	N	P
17	S	P	S	P	N	P	R	N	N	S	R	R	R
18	S	S	R	P	N	P	R	N	R	S	N	N	N
19	N	N	S	P	S	N	R	P	P	P	R	R	R
20	S	P	N	S	R	N	N	S	S	P	R	R	S
21	N	R	P	S	N	S	N	P	P	P	P	R	N
22	N	N	S	R	N	S	S	S	S	P	S	S	P
23	N	S	S	P	R	S	R	N	N	P	R	R	R
24	S	N	S	S	S	P	N	N	N	N	N	N	N
25	N	R	S	S	R	N	S	P	P	P	P	R	P
26	N	R	N	R	N	P	S	P	S	P	P	R	N
27	N	S	P	S	N	S	R	N	N	S	N	R	P
28	S	P	S	N	R	P	S	R	R	S	S	S	P
29	R	R	R	R	N	P	N	S	S	P	P	N	P
30	S	S	R	P	S	P	S	N	N	P	R	R	R
31	N	P	S	N	R	N	N	P	P	S	R	R	P
32	R	R	N	S	N	R	N	S	S	P	P	R	N
33	S	P	S	S	R	N	S	N	N	R	R	N	N
34	S	S	N	P	P	P	N	N	S	R	R	R	R
35	S	S	P	S	N	P	N	N	N	S	N	N	P
36	S	S	N	S	N	P	R	N	N	R	R	R	S
37	S	N	R	P	P	P	N	S	S	P	S	R	R
38	N	N	R	P	S	S	S	N	N	S	N	R	R
39	S	N	N	S	N	P	N	S	N	P	N	R	P
P	1	7	8	10	3	18	0	8	5	20	9	1	17
Interest S	15	11	12	12	10	6	13	13	13	12	6	3	4
Pattern N	20	11	11	12	13	10	16	17	17	3	13	13	10
Total R	3	10	8	5	13	5	10	1	4	4	11	22	8

TABLE 25.--Distribution of primary, secondary, neutral, and reject scores for each case for Pharmacy Group 4 for the combined school years 1958-59 and 1959-60

Combined Interest Pattern Totals	Strong Occupational Group Number												
	1	2	3	4	5	6	7	8	8-A	8-B	9	10	11
Primary	6	9	17	14	7	26	5	17	14	47	20	4	26
Secondary	27	27	23	22	19	11	24	25	19	22	15	5	20
Neutral	40	27	26	32	24	26	31	36	39	6	28	26	20
Reject	7	17	14	12	30	17	20	2	8	5	17	45	14

APPENDIX G

DISTRIBUTION OF PRIMARY, SECONDARY, NEUTRAL, AND REJECT SCORES FOR EIGHT PHARMACY GROUP COMPARISONS ON THIRTEEN STRONG OCCUPATIONAL GROUPS

TABLE 26.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 1 versus Pharmacy Group 2 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 1	3	19	24	2	48
1	Group 2	2	7	11	5	25
	Total	(5)	(26)	(35)	(7)	(73)
	Group 1	8	20	11	9	48
2	Group 2	4	7	6	8	25
	Total	(12)	(27)	(17)	(17)	(73)
	Group 1	9	12	20	7	48
3	Group 2	4	8	9	4	25
	Total	(13)	(20)	(29)	(11)	(73)
	Group 1	8	11	24	5	48
4	Group 2	4	3	9	9	25
	Total	(12)	(14)	(33)	(14)	(73)
	Group 1	2	7	22	17	48
5	Group 2	2	7	6	10	25
	Total	(4)	(14)	(28)	(27)	(73)
	Group 1	14	11	16	7	48
6	Group 2	7	1	12	5	25
	Total	(21)	(12)	(28)	(12)	(73)
	Group 1	3	14	27	4	48
7	Group 2	4	7	12	2	25
	Total	(7)	(21)	(39)	(6)	(73)
	Group 1	5	23	19	1	48
8	Group 2	7	6	10	2	25
	Total	(12)	(29)	(29)	(3)	(73)
	Group 1	3	21	23	1	48
8-A	Group 2	7	8	7	3	25
	Total	(10)	(29)	(30)	(4)	(73)
	Group 1	23	15	7	3	48
8-B	Group 2	16	5	1	3	25
	Total	(39)	(20)	(8)	(6)	(73)
	Group 1	7	7	17	17	48
9	Group 2	8	3	8	6	25
	Total	(15)	(10)	(25)	(23)	(73)
	Group 1	0	4	18	26	48
10	Group 2	3	6	6	10	25
	Total	(3)	(10)	(24)	(36)	(73)
	Group 1	16	10	16	6	48
11	Group 2	13	5	3	4	25
	Total	(29)	(15)	(19)	(10)	(73)

TABLE 27.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 1 versus Pharmacy Group 3 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 1	3	19	24	2	48
1	Group 3	2	6	12	0	20
	Total	(5)	(25)	(36)	(2)	(68)
	Group 1	8	20	11	9	48
2	Group 3	4	4	7	5	20
	Total	(12)	(24)	(18)	(14)	(68)
	Group 1	9	12	20	7	48
3	Group 3	4	4	7	5	20
	Total	(13)	(16)	(27)	(12)	(68)
	Group 1	8	11	24	5	48
4	Group 3	3	5	11	1	20
	Total	(11)	(16)	(35)	(6)	(68)
	Group 1	2	7	22	17	48
5	Group 3	2	4	7	7	20
	Total	(4)	(11)	(29)	(24)	(68)
	Group 1	14	11	16	7	48
6	Group 3	6	3	6	5	20
	Total	(20)	(14)	(22)	(12)	(68)
	Group 1	3	14	27	4	48
7	Group 3	2	4	12	2	20
	Total	(5)	(18)	(39)	(6)	(68)
	Group 1	5	23	19	1	48
8	Group 3	5	9	5	1	20
	Total	(10)	(32)	(24)	(2)	(68)
	Group 1	3	21	23	1	48
8-A	Group 3	3	10	5	2	20
	Total	(6)	(31)	(28)	(3)	(68)
	Group 1	23	15	7	3	48
8-B	Group 3	15	4	1	0	20
	Total	(38)	(19)	(8)	(3)	(68)
	Group 1	7	7	17	17	48
9	Group 3	5	2	8	5	20
	Total	(12)	(9)	(25)	(22)	(68)
	Group 1	0	4	18	26	48
10	Group 3	1	0	6	13	20
	Total	(1)	(4)	(24)	(39)	(68)
	Group 1	16	10	16	6	48
11	Group 3	7	6	7	0	20
	Total	(23)	(16)	(23)	(6)	(68)

TABLE 28.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 1 versus Pharmacy Group 4 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 1	3	19	24	2	48
1	Group 4	6	27	40	7	80
	Total	(9)	(46)	(64)	(9)	(128)
	Group 1	8	20	11	9	48
2	Group 4	9	27	27	17	80
	Total	(17)	(47)	(38)	(26)	(128)
	Group 1	9	12	20	7	48
3	Group 4	17	23	26	14	80
	Total	(26)	(35)	(46)	(21)	(128)
	Group 1	8	11	24	5	48
4	Group 4	14	22	32	12	80
	Total	(22)	(33)	(56)	(17)	(128)
	Group 1	2	7	22	17	48
5	Group 4	7	19	24	30	80
	Total	(9)	(26)	(46)	(47)	(128)
	Group 1	14	11	16	7	48
6	Group 4	26	11	26	17	80
	Total	(40)	(22)	(42)	(24)	(128)
	Group 1	3	14	27	4	48
7	Group 4	5	24	31	20	80
	Total	(8)	(38)	(58)	(24)	(128)
	Group 1	5	23	19	1	48
8	Group 4	17	25	36	2	80
	Total	(22)	(48)	(55)	(3)	(128)
	Group 1	3	21	23	1	48
8-A	Group 4	14	19	39	8	80
	Total	(17)	(40)	(62)	(9)	(128)
	Group 1	23	15	7	3	48
8-B	Group 4	47	22	6	5	80
	Total	(70)	(37)	(13)	(8)	(128)
	Group 1	7	7	17	17	48
9	Group 4	20	15	28	17	80
	Total	(27)	(22)	(45)	(34)	(128)
	Group 1	0	4	18	26	48
10	Group 4	4	5	26	45	80
	Total	(4)	(9)	(44)	(71)	(128)
	Group 1	16	10	16	6	48
11	Group 4	26	20	20	14	80
	Total	(42)	(30)	(36)	(20)	(128)

TABLE 29.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 2 versus Pharmacy Group 3 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 2	2	7	11	5	25
1	Group 3	2	6	12	0	20
	Total	(4)	(13)	(23)	(5)	(45)
	Group 2	4	7	6	8	25
2	Group 3	4	4	7	5	20
	Total	(8)	(11)	(13)	(13)	(45)
	Group 2	4	8	9	4	25
3	Group 3	4	4	7	5	20
	Total	(8)	(12)	(16)	(9)	(45)
	Group 2	4	3	9	9	25
4	Group 3	3	5	11	1	20
	Total	(7)	(8)	(20)	(10)	(45)
	Group 2	2	7	6	10	25
5	Group 3	2	4	7	7	20
	Total	(4)	(11)	(13)	(17)	(45)
	Group 2	7	1	12	5	25
6	Group 3	6	3	6	5	20
	Total	(13)	(4)	(18)	(10)	(45)
	Group 2	4	7	12	2	25
7	Group 3	2	4	12	2	20
	Total	(6)	(11)	(24)	(4)	(45)
	Group 2	7	6	10	2	25
8	Group 3	5	9	5	1	20
	Total	(12)	(15)	(15)	(3)	(45)
	Group 2	7	8	7	3	25
8-A	Group 3	3	10	5	2	20
	Total	(10)	(18)	(12)	(5)	(45)
	Group 2	16	5	1	3	25
8-B	Group 3	15	4	1	0	20
	Total	(31)	(9)	(2)	(3)	(45)
	Group 2	8	3	8	6	25
9	Group 3	5	2	8	5	20
	Total	(13)	(5)	(16)	(11)	(45)
	Group 2	3	6	6	10	25
10	Group 3	1	0	6	13	20
	Total	(4)	(6)	(12)	(23)	(45)
	Group 2	13	5	3	4	25
11	Group 3	7	6	7	-	20
	Total	(20)	(11)	(10)	(4)	(45)

TABLE 30.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 2 versus Pharmacy Group 4 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 2	2	7	11	5	25
1	Group 4	6	27	40	7	80
	Total	(8)	(34)	(51)	(12)	(105)
	Group 2	4	7	6	8	25
2	Group 4	9	27	27	17	80
	Total	(13)	(34)	(33)	(25)	(105)
	Group 2	4	8	9	4	25
3	Group 4	17	23	26	14	80
	Total	(21)	(31)	(35)	(18)	(105)
	Group 2	4	3	9	9	25
4	Group 4	14	22	32	12	80
	Total	(18)	(25)	(41)	(21)	(105)
	Group 2	2	7	6	10	25
5	Group 4	7	19	24	30	80
	Total	(9)	(26)	(30)	(40)	(105)
	Group 2	7	1	12	5	25
6	Group 4	26	11	26	17	80
	Total	(33)	(12)	(38)	(22)	(105)
	Group 2	4	7	12	2	25
7	Group 4	5	24	31	20	80
	Total	(9)	(31)	(43)	(22)	(105)
	Group 2	7	6	10	2	25
8	Group 4	17	25	36	2	80
	Total	(24)	(31)	(46)	(4)	(105)
	Group 2	7	8	7	3	25
8-A	Group 4	14	19	39	8	80
	Total	(21)	(27)	(46)	(11)	(105)
	Group 2	16	5	1	3	25
8-B	Group 4	47	22	6	5	80
	Total	(63)	(27)	(7)	(8)	(105)
	Group 2	8	3	8	6	25
9	Group 4	20	15	28	17	80
	Total	(28)	(18)	(36)	(23)	(105)
	Group 2	3	6	6	10	25
10	Group 4	4	5	26	45	80
	Total	(7)	(11)	(32)	(55)	(105)
	Group 2	13	5	3	4	25
11	Group 4	26	20	20	14	80
	Total	(39)	(25)	(23)	(18)	(105)

TABLE 31.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Group 3 versus Pharmacy Group 4 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Group 3	2	6	12	0	20
1	Group 4	6	27	40	7	80
	Total	(8)	(33)	(52)	(7)	(100)
	Group 3	4	4	7	5	20
2	Group 4	9	27	27	17	80
	Total	(13)	(31)	(34)	(22)	(100)
	Group 3	4	4	7	5	20
3	Group 4	17	23	26	14	80
	Total	(21)	(27)	(33)	(19)	(100)
	Group 3	3	5	11	1	20
4	Group 4	14	22	32	12	80
	Total	(17)	(27)	(43)	(13)	(100)
	Group 3	2	4	7	7	20
5	Group 4	7	19	24	30	80
	Total	(9)	(23)	(31)	(37)	(100)
	Group 3	6	3	6	5	20
6	Group 4	26	11	26	17	80
	Total	(32)	(14)	(32)	(22)	(100)
	Group 3	2	4	12	2	20
7	Group 4	5	24	31	20	80
	Total	(7)	(28)	(43)	(22)	(100)
	Group 3	5	9	5	1	20
8	Group 4	17	25	36	2	80
	Total	(22)	(34)	(41)	(3)	(100)
	Group 3	3	10	5	2	20
8-A	Group 4	14	19	39	8	80
	Total	(17)	(29)	(44)	(10)	(100)
	Group 3	15	4	1	0	20
8-B	Group 4	47	22	6	5	80
	Total	(62)	(26)	(7)	(5)	(100)
	Group 3	5	2	8	5	20
9	Group 4	20	15	28	17	80
	Total	(25)	(17)	(36)	(22)	(100)
	Group 3	1	0	6	13	20
10	Group 4	4	5	26	45	80
	Total	(5)	(5)	(32)	(58)	(100)
	Group 3	7	6	7	0	20
11	Group 4	26	20	20	14	80
	Total	(33)	(26)	(27)	(14)	(100)

TABLE 32.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Groups 1+2 versus Pharmacy Groups 3+4 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Grps. 1+2	5	26	35	7	73
1	Grps. 3+4	8	33	52	7	100
	Total	(13)	(59)	(87)	(14)	(173)
	Grps. 1+2	12	27	17	17	73
2	Grps. 3+4	13	31	34	22	100
	Total	(25)	(58)	(51)	(39)	(173)
	Grps. 1+2	13	20	29	11	73
3	Grps. 3+4	21	27	33	19	100
	Total	(34)	(47)	(62)	(30)	(173)
	Grps. 1+2	12	14	33	14	73
4	Grps. 3+4	17	27	43	13	100
	Total	(29)	(41)	(76)	(27)	(173)
	Grps. 1+2	4	14	28	27	73
5	Grps. 3+4	9	23	31	37	100
	Total	(13)	(37)	(59)	(64)	(173)
	Grps. 1+2	21	12	28	12	73
6	Grps. 3+4	32	14	32	22	100
	Total	(53)	(26)	(60)	(34)	(173)
	Grps. 1+2	7	21	39	6	73
7	Grps. 3+4	7	28	43	22	100
	Total	(14)	(49)	(82)	(28)	(173)
	Grps. 1+2	12	29	29	3	73
8	Grps. 3+4	22	34	41	3	100
	Total	(34)	(63)	(70)	(6)	(173)
	Grps. 1+2	10	29	30	4	73
8-A	Grps. 3+4	17	29	44	10	100
	Total	(27)	(58)	(74)	(14)	(173)
	Grps. 1+2	39	20	8	6	73
8-B	Grps. 3+4	62	26	7	5	100
	Total	(101)	(46)	(15)	(11)	(173)
	Grps. 1+2	15	10	25	23	73
9	Grps. 3+4	25	17	36	22	100
	Total	(40)	(27)	(61)	(45)	(173)
	Grps. 1+2	3	10	24	36	73
10	Grps. 3+4	5	5	32	58	100
	Total	(8)	(15)	(56)	(94)	(173)
	Grps. 1+2	29	15	19	10	73
11	Grps. 3+4	33	26	27	14	100
	Total	(62)	(41)	(46)	(24)	(173)

TABLE 33.--Distribution of primary, secondary, neutral, and reject scores for Pharmacy Groups 1+3 versus Pharmacy Groups 2+4 on thirteen Strong occupational groups

Strong Occ. Groups	Pharmacy Groups	Primary Scores	Secondary Scores	Neutral Scores	Reject Scores	Totals
	Grps. 1+3	5	25	36	2	68
1	Grps. 2+4	8	34	51	12	105
	Total	(13)	(59)	(87)	(14)	(173)
	Grps. 1+3	12	24	18	14	68
2	Grps. 2+4	13	34	33	25	105
	Total	(25)	(58)	(51)	(39)	(173)
	Grps. 1+3	13	16	27	12	68
3	Grps. 2+4	21	31	35	18	105
	Total	(34)	(47)	(62)	(30)	(173)
	Grps. 1+3	11	16	35	6	68
4	Grps. 2+4	18	25	41	21	105
	Total	(29)	(41)	(76)	(27)	(173)
	Grps. 1+3	4	11	29	24	68
5	Grps. 2+4	9	26	30	40	105
	Total	(13)	(37)	(59)	(64)	(173)
	Grps. 1+3	20	14	22	12	68
6	Grps. 2+4	33	12	38	22	105
	Total	(53)	(26)	(60)	(34)	(173)
	Grps. 1+3	5	18	39	6	68
7	Grps. 2+4	9	31	43	22	105
	Total	(14)	(49)	(82)	(28)	(173)
	Grps. 1+3	10	32	24	2	68
8	Grps. 2+4	24	31	46	4	105
	Total	(34)	(63)	(70)	(6)	(173)
	Grps. 1+3	6	31	28	3	68
8-A	Grps. 2+4	21	27	46	11	105
	Total	(27)	(58)	(74)	(14)	(173)
	Grps. 1+3	38	19	8	3	68
8-B	Grps. 2+4	63	27	7	8	105
	Total	(101)	(46)	(15)	(11)	(173)
	Grps. 1+3	12	9	25	22	68
9	Grps. 2+4	28	18	36	23	105
	Total	(40)	(27)	(61)	(45)	(173)
	Grps. 1+3	1	4	24	39	68
10	Grps. 2+4	7	11	32	55	105
	Total	(8)	(15)	(56)	(94)	(173)
	Grps. 1+3	23	16	23	6	68
11	Grps. 2+4	39	25	23	18	105
	Total	(62)	(41)	(46)	(24)	(173)

APPENDIX H

DISTRIBUTION OF PRIMARY + SECONDARY AND NEUTRAL + REJECT SCORES FOR EIGHT PHARMACY GROUP COMPARISONS ON THIRTEEN SVIB OCCUPATIONAL GROUPS

TABLE 34--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 1 vs. Pharmacy Group 2 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
I	Grp. 1	22	26	48
	Grp. 2	9	16	25
	Totals	(31)	(42)	(73)
II	Grp. 1	28	20	48
	Grp. 2	11	14	25
	Totals	(39)	(34)	(73)
III	Grp. 1	21	27	48
	Grp. 2	12	13	25
	Totals	(33)	(40)	(73)
IV	Grp. 1	19	29	48
	Grp. 2	7	18	25
	Totals	(26)	(47)	(73)
V	Grp. 1	9	39	48
	Grp. 2	9	16	25
	Totals	(18)	(55)	(73)
VI	Grp. 1	25	23	48
	Grp. 2	8	17	25
	Totals	(33)	(40)	(73)
VII	Grp. 1	17	31	48
	Grp. 2	11	14	25
	Totals	(28)	(45)	(73)
VIII	Grp. 1	28	20	48
	Grp. 2	13	12	25
	Totals	(41)	(32)	(73)
VIII-A	Grp. 1	24	24	48
	Grp. 2	15	10	25
	Totals	(39)	(34)	(73)
VIII-B	Grp. 1	38	10	48
	Grp. 2	21	4	25
	Totals	(59)	(14)	(73)
IX	Grp. 1	14	34	48
	Grp. 2	11	14	25
	Totals	(25)	(48)	(73)
X	Grp. 1	4	44	48
	Grp. 2	9	16	25
	Totals	(13)	(60)	(73)
XI	Grp. 1	26	22	48
	Grp. 2	18	7	25
	Totals	(44)	(29)	(73)

TABLE 35--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 1 vs. Pharmacy Group 3 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grp. 1	22	26	48
I	Grp. 3	8	12	20
	Totals	(30)	(38)	(68)
	Grp. 1	28	20	48
II	Grp. 3	8	12	20
	Totals	(36)	(32)	(68)
	Grp. 1	21	27	48
III	Grp. 3	8	12	20
	Totals	(29)	(39)	(68)
	Grp. 1	19	29	48
IV	Grp. 3	8	12	20
	Totals	(27)	(41)	(68)
	Grp. 1	9	39	48
V	Grp. 3	6	14	20
	Totals	(15)	(53)	(68)
	Grp. 1	25	23	48
VI	Grp. 3	9	11	20
	Totals	(34)	(34)	(68)
	Grp. 1	17	31	48
VII	Grp. 3	6	14	20
	Totals	(23)	(45)	(68)
	Grp. 1	28	20	48
VIII	Grp. 3	14	6	20
	Totals	(42)	(26)	(68)
	Grp. 1	24	24	48
VIII-A	Grp. 3	13	7	20
	Totals	(37)	(31)	(68)
	Grp. 1	38	10	48
VIII-B	Grp. 3	19	1	20
	Totals	(57)	(11)	(68)
	Grp. 1	14	34	48
IX	Grp. 3	7	13	20
	Totals	(21)	(47)	(68)
	Grp. 1	4	44	48
X	Grp. 3	1	19	20
	Totals	(5)	(63)	(68)
	Grp. 1	26	22	48
XI	Grp. 3	13	7	20
	Totals	(39)	(29)	(68)

TABLE 36--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 1 vs. Pharmacy Group 4 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grp. 1	22	26	48
I	Grp. 4	33	47	80
	Totals	(55)	(73)	(128)
	Grp. 1	28	20	48
II	Grp. 4	36	44	80
	Totals	(64)	(64)	(128)
	Grp. 1	21	27	48
III	Grp. 4	40	40	80
	Totals	(61)	(67)	(128)
	Grp. 1	19	29	48
IV	Grp. 4	36	44	80
	Totals	(55)	(73)	(128)
	Grp. 1	9	39	48
V	Grp. 4	26	54	80
	Totals	(35)	(93)	(128)
	Grp. 1	25	23	48
VI	Grp. 4	37	43	80
	Totals	(62)	(66)	(128)
	Grp. 1	17	31	48
VII	Grp. 4	29	51	80
	Totals	(46)	(82)	(128)
	Grp. 1	28	20	48
VIII	Grp. 4	42	38	80
	Totals	(70)	(58)	(128)
	Grp. 1	24	24	48
VIII-A	Grp. 4	33	47	80
	Totals	(57)	(71)	(128)
	Grp. 1	38	10	48
VIII-B	Grp. 4	69	11	80
	Totals	(107)	(21)	(128)
	Grp. 1	14	34	48
IX	Grp. 4	35	45	80
	Totals	(49)	(79)	(128)
	Grp. 1	4	44	48
X	Grp. 4	9	71	80
	Totals	(13)	(115)	(128)
	Grp. 1	26	22	48
XI	Grp. 4	46	34	80
	Totals	(72)	(56)	(128)

TABLE 37--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 2 vs. Pharmacy Group 3 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grp. 2	9	16	25
I	Grp. 3	8	12	20
	Totals	(17)	(28)	(45)
	Grp. 2	11	14	25
II	Grp. 3	8	12	20
	Totals	(19)	(26)	(45)
	Grp. 2	12	13	25
III	Grp. 3	8	12	20
	Totals	(20)	(25)	(45)
	Grp. 2	7	18	25
IV	Grp. 3	8	12	20
	Totals	(15)	(30)	(45)
	Grp. 2	9	16	25
V	Grp. 3	6	14	20
	Totals	(15)	(30)	(45)
	Grp. 2	8	17	25
VI	Grp. 3	9	11	20
	Totals	(17)	(28)	(45)
	Grp. 2	11	14	25
VII	Grp. 3	6	14	20
	Totals	(17)	(28)	(45)
	Grp. 2	13	12	25
VIII	Grp. 3	14	6	20
	Totals	(27)	(18)	(45)
	Grp. 2	15	10	25
VIII-A	Grp. 3	13	7	20
	Totals	(28)	(17)	(45)
	Grp. 2	21	4	25
VIII-B	Grp. 3	19	1	20
	Totals	(40)	(5)	(45)
	Grp. 2	11	14	25
IX	Grp. 3	7	13	20
	Totals	(18)	(27)	(45)
	Grp. 2	9	16	25
X	Grp. 3	1	19	20
	Totals	(10)	(35)	(45)
	Grp. 2	18	7	25
XI	Grp. 3	13	7	20
	Totals	(31)	(14)	(45)

TABLE 38--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 2 vs. Pharmacy Group 4 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grp. 2	9	16	25
I	Grp. 4	33	47	80
	Totals	(42)	(63)	(105)
	Grp. 2	11	14	25
II	Grp. 4	36	44	80
	Totals	(47)	(58)	(105)
	Grp. 2	12	13	25
III	Grp. 4	40	40	80
	Totals	(52)	(53)	(105)
	Grp. 2	7	18	25
IV	Grp. 4	36	44	80
	Totals	(43)	(62)	(105)
	Grp. 2	9	16	25
V	Grp. 4	26	54	80
	Totals	(35)	(70)	(105)
	Grp. 2	8	17	25
VI	Grp. 4	37	43	80
	Totals	(45)	(60)	(105)
	Grp. 2	11	14	25
VII	Grp. 4	29	51	80
	Totals	(40)	(65)	(105)
	Grp. 2	13	12	25
VIII	Grp. 4	42	38	80
	Totals	(55)	(50)	(105)
	Grp. 2	15	10	25
VIII-A	Grp. 4	33	47	80
	Totals	(48)	(57)	(105)
	Grp. 2	21	4	25
VIII-B	Grp. 4	69	11	80
	Totals	(90)	(15)	(105)
	Grp. 2	11	14	25
IX	Grp. 4	35	45	80
	Totals	(46)	(59)	(105)
	Grp. 2	9	16	25
X	Grp. 4	9	71	80
	Totals	(18)	(87)	(105)
	Grp. 2	18	7	25
XI	Grp. 4	46	34	80
	Totals	(64)	(41)	(105)

TABLE 39--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Group 3 vs. Pharmacy Group 4 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grp. 3	8	12	20
I	Grp. 4	33	47	80
	Totals	(41)	(59)	(100)
	Grp. 3	8	12	20
II	Grp. 4	36	44	80
	Totals	(44)	(56)	(100)
	Grp. 3	8	12	20
III	Grp. 4	40	40	80
	Totals	(48)	(52)	(100)
	Grp. 3	8	12	20
IV	Grp. 4	36	44	80
	Totals	(44)	(56)	(100)
	Grp. 3	6	14	20
V	Grp. 4	26	54	80
	Totals	(32)	(68)	(100)
	Grp. 3	9	11	20
VI	Grp. 4	37	43	80
	Totals	(46)	(54)	(100)
	Grp. 3	6	14	20
VII	Grp. 4	29	51	80
	Totals	(35)	(65)	(100)
	Grp. 3	14	6	20
VIII	Grp. 4	42	38	80
	Totals	(56)	(44)	(100)
	Grp. 3	13	7	20
VIII-A	Grp. 4	33	47	80
	Totals	(46)	(54)	(100)
	Grp. 3	19	1	20
VIII-B	Grp. 4	69	11	80
	Totals	(88)	(12)	(100)
	Grp. 3	7	13	20
IX	Grp. 4	35	45	80
	Totals	(42)	(58)	(100)
	Grp. 3	1	19	20
X	Grp. 4	9	71	80
	Totals	(10)	(90)	(100)
	Grp. 3	13	7	20
XI	Grp. 4	46	34	80
	Totals	(59)	(41)	(100)

TABLE 40--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Groups 1+2 vs. Pharmacy Groups 3+4 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grps. 1+2	31	42	73
I	Grps. 3+4	41	59	100
	Totals	(72)	(101)	(173)
	Grps. 1+2	39	34	73
II	Grps. 3+4	44	56	100
	Totals	(83)	(90)	(173)
	Grps. 1+2	33	40	73
III	Grps. 3+4	48	52	100
	Totals	(81)	(92)	(173)
	Grps. 1+2	26	47	73
IV	Grps. 3+4	44	56	100
	Totals	(70)	(103)	(173)
	Grps. 1+2	18	55	73
V	Grps. 3+4	32	68	100
	Totals	(50)	(123)	(173)
	Grps. 1+2	33	40	73
VI	Grps. 3+4	46	54	100
	Totals	(79)	(94)	(173)
	Grps. 1+2	28	45	73
VII	Grps. 3+4	35	65	100
	Totals	(63)	(110)	(173)
	Grps. 1+2	41	32	73
VIII	Grps. 3+4	56	44	100
	Totals	(97)	(76)	(173)
	Grps. 1+2	39	34	73
VIII-A	Grps. 3+4	46	54	100
	Totals	(85)	(88)	(173)
	Grps. 1+2	59	14	73
VIII-B	Grps. 3+4	88	12	100
	Totals	(147)	(26)	(173)
	Grps. 1+2	25	48	73
IX	Grps. 3+4	42	58	100
	Totals	(67)	(106)	(173)
	Grps. 1+2	13	60	73
X	Grps. 3+4	10	90	100
	Totals	(23)	(150)	(173)
	Grps. 1+2	44	29	73
XI	Grps. 3+4	59	41	100
	Totals	(103)	(70)	(173)

TABLE 41--Distribution of primary + secondary scores and neutral + reject scores for Pharmacy Groups 1+3 vs. Pharmacy Groups 2+4 on thirteen SVIB occupational groups

SVIB Occ. Groups	Pharmacy Groups	Primary + Secondary Scores	Neutral + Reject Scores	Totals
	Grps. 1+3	30	38	68
I	Grps. 2+4	42	63	105
	Totals	(72)	(101)	(173)
	Grps. 1+3	36	32	68
II	Grps. 2+4	47	58	105
	Totals	(83)	(90)	(173)
	Grps. 1+3	29	39	68
III	Grps. 2+4	52	53	105
	Totals	(81)	(92)	(173)
	Grps. 1+3	27	41	68
IV	Grps. 2+4	43	62	105
	Totals	(70)	(103)	(173)
	Grps. 1+3	15	53	68
V	Grps. 2+4	35	70	105
	Totals	(50)	(123)	(173)
	Grps. 1+3	34	34	68
VI	Grps. 2+4	45	60	105
	Totals	(79)	(94)	(173)
	Grps. 1+3	23	45	68
VII	Grps. 2+4	40	65	105
	Totals	(63)	(110)	(173)
	Grps. 1+3	42	26	68
VIII	Grps. 2+4	55	50	105
	Totals	(97)	(76)	(173)
	Grps. 1+3	37	31	68
VIII-A	Grps. 2+4	48	57	105
	Totals	(85)	(88)	(173)
	Grps. 1+3	57	11	68
VIII-B	Grps. 2+4	90	15	105
	Totals	(147)	(26)	(173)
	Grps. 1+3	21	47	68
IX	Grps. 2+4	46	59	105
	Totals	(67)	(106)	(173)
	Grps. 1+3	5	63	68
X	Grps. 2+4	18	87	105
	Totals	(23)	(150)	(173)
	Grps. 1+3	39	29	68
XI	Grps. 2+4	64	41	105
	Totals	(103)	(70)	(173)

APPENDIX I

DISTRIBUTION OF ESTIMATED CELL FREQUENCIES BELOW 5 FOR A 2 BY 4 AND A 2 BY 2 TABLE TEST FOR EIGHT PHARMACY GROUP COMPARISONS ON THIRTEEN SVIB OCCUPATIONAL GROUPS

Table 42--Distribution of estimated cell frequencies below 5 for a 2 by 4 table test for eight pharmacy group comparisons on thirteen SVIB occupational groups

Pharmacy Group Comparisons	SVIB Occupational Groups													
	I	II	III	IV	V	VI	VII	VIII	VIII-A	VIII-B	IX	X	XI	TOTALS
1 vs. 2	4	1	2	3	3	2	4	3	3	3	1	3	1	(33)
1 vs. 3	4	2	3	4	3	2	4	3	4	3	2	4	3	(41)
1 vs. 4	2	-	-	-	1	-	1	2	1	2	-	3	-	(12)
2 vs. 3	4	3	3	5	2	3	5	2	3	5	3	4	4	(46)
2 vs. 4	2	1	1	1	1	1	1	2	1	2	1	2	1	(17)
3 vs. 4	2	2	2	2	2	2	2	3	2	3	2	4	1	(29)
1+2 vs. 3+4	-	-	-	-	-	-	-	2	-	1	-	2	-	(5)
1+3 vs. 2+4	-	-	-	-	-	-	-	2	-	1	-	2	-	(5)
TOTALS	(18)	(9)	(11)	(15)	(12)	(10)	(17)	(19)	(14)	(20)	(9)	(24)	(10)	188

Table 43--Distribution of estimated cell frequencies below 5 for a 2 by 2 table test for eight pharmacy group comparisons on thirteen SVIB occupational groups

Pharmacy Group Comparisons	SVIB Occupational Groups													
	I	II	III	IV	V	VI	VII	VIII	VIII-A	VIII-B	IX	X	XI	TOTALS
1 vs. 2	-	-	-	-	-	-	-	-	-	1	-	1	-	(2)
1 vs. 3	-	-	-	-	1	-	-	-	-	1	-	2	-	(4)
1 vs. 4	-	-	-	-	-	-	-	-	-	-	-	1	-	(1)
2 vs. 4	-	-	-	-	-	-	-	-	-	2	-	1	-	(3)
2 vs. 4	-	-	-	-	-	-	-	-	-	1	-	1	-	(2)
3 vs. 4	-	-	-	-	-	-	-	-	-	1	-	1	-	(2)
1+2 vs. 3+4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1+3 vs. 2+4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS					(1)					(6)		(7)		14

APPENDIX J

LISTING OF THE CUMULATIVE GRADE POINT AVERAGES FOR EACH CASE FOR FOUR PHARMACY GROUPS FOR THE SCHOOL YEARS 1958-59 AND 1959-60

TABLE 44--Listing of the cumulative grade point averages for each case for Pharmacy Group 1 for the school years 1958-59 and 1959-60.

School Year 1958-59		School Year 1959-60	
Case No.	Cum. Grade Point Average	Case No.	Cum. Grade Point Average
1	3.15	1	2.76
2	2.16	2	2.64
3	2.27	3	2.61
4	2.23	4	2.12
5	2.05	5	3.78
6	2.19	6	2.37
7	2.63	7	2.32
8	2.43	8	2.27
9	2.04	9	3.51
10	2.38	10	2.10
11	2.14	11	2.42
12	3.55	12	2.96
13	2.48	13	2.43
14	2.41	14	3.50
15	2.38	15	2.16
		16	2.01
		17	2.19
		18	2.27
		19	3.03
		20	2.15
		21	2.46
		22	2.25
		23	2.69
		24	2.80
		25	2.16
		26	2.70
		27	3.53
		28	2.30
		29	2.31
		30	2.56
		31	2.05
		32	3.34
		33	3.20

TABLE 45--Listing of the cumulative grade point averages for each case for Pharmacy Group 2 for the school years 1958-59 and 1959-60.

School Year 1958-59		School Year 1959-60	
Case No.	Cum. Grade Point Average	Case No.	Cum. Grade Point Average
1	2.01	1	2.55
2	2.25	2	2.05
3	2.66	3	2.65
4	2.27	4	2.55
5	2.50	5	2.58
6	2.43	6	3.16
7	2.01	7	2.63
8	2.11	8	2.97
9	2.08	9	2.56
10	2.03	10	2.43
11	3.38	11	2.08
		12	2.95
		13	2.61
		14	2.13

TABLE 46--Listing of the cumulative grade point averages for each case for Pharmacy Group 3 for the school years 1958-59 and 1959-60.

School Year 1958-59		School Year 1959-60	
Case No.	Cum. Grade Point Average	Case No.	Cum. Grade Point Average
1	1.92	1	1.85
2	1.91	2	1.91
3	1.98	3	1.95
4	1.87	4	1.89
5	1.98	5	1.80
6	1.86	6	1.88
		7	1.93
		8	1.79
		9	1.90
		10	1.83
		11	1.89
		12	1.98
		13	1.97
		14	1.90

TABLE 47--Listing of the cumulative grade point averages for each case for Pharmacy Group 4 for the school years 1958-59 and 1959-60.

School Year 1958-59		School Year 1959-60	
Case No.	Cum. Grade Point Average	Case No.	Cum. Grade Point Average
1	1.26	1	1.70
2	1.72	2	1.52
3	1.70	3	.92
4	1.88	4	1.47
5	1.75	5	1.92
6	1.54	6	1.34
7	1.63	7	1.40
8	1.85	8	1.87
9	1.51	9	1.74
10	.76	10	1.54
11	1.47	11	1.09
12	1.72	12	.87
13	1.30	13	1.05
14	.00	14	1.64
15	1.58	15	1.82
16	1.63	16	1.83
17	1.69	17	1.72
18	1.74	18	1.67
19	1.98	19	1.62
20	1.53	20	1.69
21	1.72	21	1.75
22	1.71	22	1.14
23	1.19	23	1.23
24	1.39	24	1.15
25	.24	25	1.75
26	1.83	26	1.53
27	.94	27	1.75
28	1.52	28	1.29
29	1.86	29	1.57
30	1.08	30	1.47
31	.80	31	1.51
32	1.70	32	1.85
33	1.52	33	1.63
34	1.56	34	1.44
35	1.43	35	.77
36	1.52	36	1.75
37	1.87	37	1.83
38	1.60	38	1.91
39	1.90	39	1.53
40	1.61		
41	1.18		

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