

THE USE OF INTEREST TESTING AS A PROGNOSTICATOR
OF ACADEMIC SUCCESS IN ONE SCHOOL OF NURSING

by

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ABSTRACT

The purposes of this investigation were: (1) to determine the extent to which knowledge and interest combine as a prognosticator of a beginning college nursing student's course of study and successful choice of field, and (2) to indicate interests that are specific to the academically-competent nursing student that are lacking in the average or failing student.

There was one principal instrument involved in the data collection for this report, the Miller Knowledge-Interest Test. It was given in May, 1960 to a group of 158 Freshman women who had taken this same test upon entrance into college the previous Autumn quarter of 1959. The Placement Test results were used as a criterion for comparison and these two were supplemented by examination of the findings from the student records which offered each girl's grade point average for the quarter.

The information received from these three sources revealed that the Knowledge-Interest and Placement tests alone were of limited value as a discriminating tool, but combined to form an accurate predictor of academic success. The Knowledge-Interest Test does not have the ability to distinguish between the academically-competent, average, and failing nursing students, since students in each of the three categories subscribed to nearly the same interests but displayed different degrees of achievement. It has meaningful implications in the realm of counseling when used with the results of the Placement test and would be an aid in the clinical nursing courses to predict the student's final achievement.

CHAPTER I

THE FORMULATION AND DEFINITION OF THE PROBLEM

It has become apparent in recent years that our colleges and universities are existing in an increasingly over-populated state. Because of this, many authorities in the field of education are advocating the use of various methods of selection of students and the subsequent alleviation of the problem.

There are tests to evaluate the applicant's previous preparation for college and to determine his scholastic ability; and there are tests designed to measure the individual's interest in different occupations and fields, thereby identifying the particular field or fields in which he will find most success. Such tests have been used extensively in schools of nursing throughout the country. However, the usual method by which interests of individuals have been measured has been through the use of tests containing situational problems or specific areas of vocational interest. A personality test is not included in the National League for Nursing Pre-Nursing and Guidance Examination because, as Spaney points out,¹ the paper and pencil tests of personality traits that have been developed do not make a large enough contribution to the prediction of success in schools of nursing to justify their inclusion in such a test battery.

This paper was an attempt to show the merit of using an interest test, on the collegiate level, which claimed to assess the individual's

¹Emma Spaney, "Personality Tests and the Selection of Nurses", Nursing Research 1, (February, 1953), pp. 4-26.

interest in knowledge of course subjects, thereby making it possible to more accurately predict success in the nursing curriculum.

To accomplish this endeavor, emphasis was placed on the use of a knowledge-interest test devised by A.W. Miller for use at Montana State College. Mr. Miller contended that when planning college courses, it is important to consider the interests of students who will be class members. Consequently, the Knowledge-Interest Test was designed to give students an opportunity to indicate their interests in many of the subjects taught at the college. The author believed that:²

1. We can develop a reliable measure of interest;
2. This measure gives distinct interest patterns;
3. These patterns fit the successful individual in different curricula with a different pattern for each curriculum;
4. If these three statements are correct, then we can significantly improve our accuracy of predicting success in the different curricula, now based on intelligence tests.

This test was scored according to the student's preference of specific course subjects designated to be taught in the different curricula, and these subjects were rated as Liked, Indifferent, or Disliked. The subjects in the test which are concerned with the nursing curriculum are:

Likes

- | | |
|------------------------|-------------------------------------|
| 1. Abnormal Psychology | 8. Community Mental Health Problems |
| 2. Care of Patients | 9. Control of Communicable Disease |
| 3. Obstetrical Nursing | 10. Human Behavior |
| 4. Child Development | 11. Medical-Surgical Nursing |
| 5. Community Health | 12. Social Problems |
| 6. Psychiatric Nursing | |
| 7. First Aid | |

²Adam W. Miller, Head, Department of Psychology, Montana State College, Bozeman, Montana. Exerpt from a conversation held on February 3, 1961.

13. Microorganisms and Human Disease
14. Public Health Nursing

15. Study of the Blood

Dislikes

- | | |
|------------------------------------|-----------------------------------|
| 1. Manufacturing Cost Analysis | 4. Soil Classification and Survey |
| 2. Montana Geography and Resources | 5. Soil Fertility and Fertilizers |
| 3. Range Production | |

This study was an attempt to promote the establishment of the Miller Knowledge-Interest Test as it is used in predicting academic success in the nursing curriculum by showing the relation of preferred course subjects to success in the nursing curriculum.

I. THE PROBLEM

Statement of the problem. Can a beginner in the nursing profession be effectively tested in such a way that the scores will predict success in the curriculum?

It was the purpose of this study, as revealed through the use of the Miller Knowledge-Interest Test, (1) to determine the extent to which knowledge and interests combine as a prognosticator of a beginning college student's course of study and successful choice of field; and (2) to indicate interests that are specific to the academically-competent nursing student that are lacking in the average or failing student.

Basic assumptions. We can significantly improve the accuracy in predicting academic success by measuring an individual's interest in knowledge of subject matter. Risk has pointed out that interests are not separate entities to be measured directly. "For this reason any tests or devices

used to measure attitudes [interests] alone will only give us a partial set of data. There must be added to these data, all evidence that will give clues to any motives back of conduct indicative of values, especially that secured in attempts to measure personality and conduct."³

Further, we can assume that this prediction of academic success will apply to specific curricula and that the interest pattern of nursing students is significantly different from that of students in the other curricula, that when a low interest level in nursing is indicated by the test, the probable success in that curriculum is greatly reduced.

We further assume that this prediction applies to high school as well as college-level students. The knowledge-interest test is a selective tool used to identify the areas where satisfactory academic achievement is most apparent and should provide material for more effective counseling on both levels.

Therefore, once it has been established whether or not there are specific interests peculiar to the beginning nursing student, we assume that it will be possible to give more rational direction to girls who are interested in the nursing curriculum.

This study attempted to show that there are interests specific and maintained by academically-competent students as compared with the interest pattern of the average or failing student.

Importance of the study. Measurement in education is constantly being used as a tool by which to evaluate an individual or his course of

³Thomas M. Risk, Principles and Practices of Teaching in Secondary Schools (New York: American Book Company, 1947), p. 641.

action. Broadly speaking, educators and psychologists are interested in measuring two general areas, the individual's ability, or his aptitude and achievement, and the aspects of his personality such as his attitudes and interests.

In the realm of interest measurement, much has been done in appraising the tendencies of individuals to seek or avoid particular activities.

" . . . a person does not necessarily do best the things which interest him most, and it is also true that interest in a task may very well be stimulated by success in its achievement."⁴

One of the best known instruments is the Strong Vocational Interest Blank whose chief purpose is to show a person the extent to which his interests correspond to those of successful men and women in a variety of occupations. Although his test has been more fully developed for men, one of its purposes, that of promoting research, has contributed greatly to our knowledge of interests. Less research has been done on the use of this test for women, but Darley and Hagenah believe⁵ that as the culture patterns begin to break and as more women enter the professional fields, the measurement of women's interests will become more crucial to society. Because the Strong test for women is less complete than that for men, Darley advocates the use of the men's blank for prospective college women applicants.

Dr. Strong devised his test as a means of predicting vocational

⁴The Kuder Preference Record in the Counseling of Nurses New York: American Journal of Nursing, May 1946, p. 313.

⁵John G. Darley and Theda Hagenah, Vocational Interest Measurement, Theory and Practice (Minneapolis: The University of Minnesota Press, 1955), p. 70.

success and directed its use to groups of college students and senior high pupils with definite college plans. Strong notes that interests change with age and that the younger the person on the first test, the greater the likelihood of change thereafter. He states that scores are dependable after the age of seventeen.⁶ However, in predicting academic success, Ferguson states⁷ that the Vocational Interest Blank does poorly what an intelligence test or scholastic aptitude test can do much better. In reference to vocational success, he recognizes the validity of the Strong test in the life insurance field where a definite correlation has been made between the test score and success. Other fields need further study. In appraising the validity of this interest inventory, Thorndike points out⁸ that a number of studies have indicated that the Strong can be faked.

Because of his research, Strong knows something of the extent to which certain interests are related to certain personality traits, to intelligence, to various aptitudes, to high and low occupational groups, and that interest constitutes a definite and measureable segment of personality.⁹

⁶Lee J. Cronbach, Essentials of Psychological Testing (New York: Harper and Brothers, 1949), p. 348.

⁷Leonard W. Ferguson, Personality Measurement (New York: McGraw-Hill Book Company, Incorporated, 1952), p. 51.

⁸Robert Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, 1956), pp. 380 - 383.

⁹Ferguson, op.cit., pp. 69-70.

Another well-known instrument is that originated by Dr. G. Frederick Kuder and provides scores on a number of basic preferences. Kuder was prompted by Strong's work to develop his own method of interest measurement, and like Strong, Kuder's test is primarily intended for vocational guidance. Unlike Strong, whose purpose was to establish empirical differences among occupational groups, Kuder developed his scales on a rational basis and with no intention of correlation with each other. He felt that the empirical application of his scales should follow their rational development. It is this rational basis that provokes Ferguson's concern. "Kuder states that a few of the suggestions are based on research data, but the vast majority are based on nothing more than Kuder's judgment as to what occupations should be considered."¹⁰ Ferguson explained that while he had nothing against Kuder's judgment, judgment was involved. The relationship between the two tests devised by these men shows a striking resemblance and this similarity indicates a considerable degree of substantial validity.

Because Kuder's Preference Records are geared to the younger student and for the student who has not yet determined his professional career, they are widely used in guidance and counseling on the high school level. Here they lead the student to consider a general field such as the physical sciences without concern as to whether his career will be in Chemistry, Physics or allied fields. Therefore, the use of these records to obtain data on a student's probable academic success is of limited value.

A study was begun in 1947 by Frances O. Triggs on the Kuder Preference Record as it measured interests of nurses. During the course of

¹⁰Ibid.

this study, Triggs determined that nurses were low in persuasive ability and were an inarticulate group because the curriculum was inflexible and did not encourage self-expression.¹¹ There was little emphasis on the social sciences and much on the physical sciences. Triggs was prepared to determine the interest pattern over a period of years since the situation was changing and more emphasis was being put on expression of self.

This predictive validity is perhaps the most essential component in determining by an interest inventory the individual's future success. Thorndike and Hagen assert that validity is the crucial test of a measurement procedure and that predictive validity is the validity of the instrument or test when it is related to some criterion of performance or success in the future.¹² Strong has some evidence of this type but it is limited. Importance is assigned to reliability only as a necessary condition for a measure to have validity. Of the types of data needed to get an estimate of reliability, Thorndike gives the evidence based on a parallel test form the most weight in evaluating the reliability of a test. Both the Strong and Kuder tests yield reasonably reliable scores.

Tests like those in the National League for Nursing Pre-Nursing and Guidance Examination limit their measurement to scholastic ability and achievement and expect to predict only whether an applicant can acquire the knowledge necessary for practice as a registered nurse. However, the merit of this lies in the fact that well over one-quarter of the withdrawals from

¹¹Frances O. Triggs, The Measured Interests of Nurses (New York: Journal of Educational Research, XLII, 1947), pp. 117-118.

¹²Thorndike and Hagen, op.cit., p. 134.

basic schools are the result of classwork failure.¹³ Thus far, the League has been unable to accept the paper and pencil tests developed for detecting personality traits because of their lack of predictive success in schools of nursing.

Since one of the great educational problems we face today is the inefficacious use of our colleges, this study attempted to secure more information concerning a valid and practical method of assessing a nursing candidate's interest in knowledge as a predictor of her success in the nursing curriculum. Application of this information should partially eliminate the multi-faceted problem of wasted time in the wrong curriculum, of financial investment in education, or of registration in courses which are incompatible with the student's interest and knowledge.

II. HYPOTHESIS

It is hypothesized that by determining interest patterns of students in the nursing curriculum, it will be possible to significantly improve the accuracy of predicting success in the curriculum, now based largely on intelligence tests.

Furthermore, it is hypothesized that the academically-competent nursing student will exhibit a more varied and consistent interest pattern of course subject preferences than the average or potentially-failing student.

Subhypothesis I: The academically-competent student will show an

¹³Ella A. Taylor, A Three-Year Study of Withdrawal of Students from Schools of Nursing (New York: National League of Nursing Education, 1951).

interest in subjects specifically designated by the Miller test as Likes, (see page two). She will also indicate interests in knowledge of course subjects concerned with government, economy, education, philosophy, psychology, and the physical sciences as listed below:

- | | |
|-------------------------------|--------------------------------------|
| 1. American Economy | 10. Human Motivation and Personality |
| 2. Bacteriological Principles | 11. Logic |
| 3. Biochemical Methods | 12. Organic Chemistry |
| 4. Current Educational Trends | 13. Philosophy |
| 5. Educational Problems | 14. Philosophy of Teaching |
| 6. General Chemistry | 15. Purposes of Public Schools |
| 7. General Physics | 16. Teaching Methods |
| 8. Government of the U.S. | 17. Zoology |
| 9. Human Learning | |

Subhypothesis II: The average student will indicate interests in course subjects that deviate little from the pattern specifically designated in the Miller test. She will show more Indifferent answers for those subject areas mentioned above in which the competent student will indicate Likes.

Subhypothesis III: The potentially-failing student may show an interest in course subjects obviously intended for nursing students, such as Care of Patients and Obstetrical Nursing. She will show more Dislikes for those areas identified by the average student as Indifferences and by the competent student as Likes.

III. DEFINITIONS OF TERMS USED

Interests. A tendency to seek out an activity or object, or a tendency to choose it rather than some alternative.

Interest pattern. An interest pattern is interpreted as a composite of course subjects found to be most interesting to a group of students

in one particular field. These subjects form a pattern peculiar to the majority of students interested in that field whether or not they are presently enrolled.

Nursing profession. The use of this term is confined to professional personnel, and although frequently referred to as being in the nursing profession, non-professional hospital personnel will be excluded.

Discriminating Score. The score used to distinguish between the academically-competent, average, and potentially-failing nursing student and based on their reactions to the seventeen additional items listed on page fourteen.

Academically-competent. Since this study was conducted at Montana State College, the student considered academically-competent will have a 3.0-4.0 grade point average which is equivalent to a "B" and "A" respectively. The Average student will have a "C" or 2.0 grade point average.

IV. SUMMARY

In the realm of interest testing, Strong and Kuder have contributed much in the way of predicting vocational success. However, in many instances, especially on the college level, the amount of success in a vocation is directly dependent on the success of the individual's academic preparation.

Through the use of the Miller Knowledge-Interest Test, a student can indicate his interest in course subjects available for study. These interests will be a predictor of academic success in each of the available curricula. Therefore, once it has been established whether or not there

are specific interests peculiar to the beginning nursing student, we assume that it will be possible to give more rational direction to girls who are interested in the nursing curriculum. Perhaps the most significant aspect of the study is whether there is a specific interest pattern maintained by academically-competent, average, and potentially-failing nursing students and if this pattern is apparent on the first taking of the test. If it can be shown that this test has validity in predicting a measure of success in the collegiate development of a nursing student, the use of it in schools of nursing would further aid in the job of student evaluation, most of which is now based on achievement tests.

CHAPTER II

THE NATURE OF THE SAMPLE AND THE METHOD OF DATA COLLECTION

There are many areas open for research in the nursing profession, all of which are designed to ultimately improve nursing care.

The concern which prompted this study had as its origin the results of a State Board licensure examination. It was recognized that the passing score for this licensing test represented the minimum qualities that a nurse should possess in order to give safe patient care. The idea came to mind that there should be a way in which some of the qualities of the nurse candidate, both personal and academic, could be assessed before she entered the profession, thereby making it possible to have constructive counseling done with the student.

An adequate measuring device was therefore sought that would give some indication of a student's feelings toward nursing as well as her scholastic tendencies. The Kuder Preference Test and the Strong Interest Inventory have contributed much in the way of predicting vocational success. However, in many instances, especially on the college level, the amount of success in a vocation is directly dependent on the extent of the individual's academic preparation. It was recognized that academic achievement does not necessarily represent the best nurse, nevertheless, the academic standing was chosen as the criterion for success because academic achievement in college level courses determines whether or not the student will be permitted to enter the hospital portion of the nursing program.

The instrument used for the collection of data. There was an

interesting tool under study at Montana State College that dealt with the measurement of both interest and knowledge and was invented for the purpose of predicting academic success. This Knowledge-Interest Test, devised by A.W. Miller, allowed the new student to indicate his interest in course subjects that were available for study. It was assumed that these interests in knowledge would be a predictor of academic success in each of the available curricula.

There are certain qualities desired in any measurement procedure and perhaps the most crucial test of a measuring instrument is its validity. There is evidence available which will indicate the validity of an instrument by subjecting it either to rational or empirical judgment. A wide range of testing situations are encountered in which appraisal of this validity depends primarily on rational analysis. The analysis may be of the test content or of processes that correspond to a particular concept. Empirical evidence comes from the relationship of the instrument or test to some other measure or fact.

The investigator assumed that the Miller Knowledge-Interest Test is valid and there is some direct evidence to this effect:

1. The test has content validity which is achieved through the use of comprehensible course subject titles that are brief,¹ clearly defined, and easily understood. Thorndike mentions that the objective for content validity is to make it conform as closely as possible to the important content of the course, activity or job.
2. Further evidence of validity is apparent by the relationship of the scores to the objective measures of scholastic aptitude and academic choice of curriculum, either as a stated preference or

¹Thorndike and Hagen, op.cit., p. 111.

actual entrance into the curriculum.

3. Reliability is another factor to be considered as a necessary condition for a measure to have validity. Risk points out² that the reliability of a test depends principally on two main factors. The first is the objectivity of scoring, and second, the kind and extent of the items making up the test. The Miller test is scored by the IBM method, thus allowing each student to be evaluated objectively and accurately. In this study, each test was hand-scored by means of a punch card so that different comparisons and observations could be made during the scoring process. The kind and extent of test items in the Miller test are self-evident and brief enough to offer few problems as far as content is concerned. However, in order to authentically evaluate the reliability of a measure, the evidence based on equivalent test forms should usually be given the most weight.³ This is feasible with the Miller test and could be accomplished by building separate forms, each with common course subjects but with different titles.

Other qualities desired in a measurement procedure are economy and ease of administration. The cost of this particular instrument is held to a minimum because each test is accompanied by a separate answer sheet which permits repeated use of the test. It is also administered with facility since the instructions are simple and the contents require little reading. The test is simple in its format and does not engender fears and stresses in the respondents.

The conditions under which this study was conducted were, for the most part, very satisfactory. Although the test, because of its content, was necessarily confined to Montana State College, its use is feasible throughout the entire university system in Montana. The method of administering the test to the Freshman students allows each person equal time in which to finish. Thorndike advises against using an instrument involving a good deal of reading since their use with individuals who fall below

²Risk, op.cit., p. 624. ³Thorndike and Hagen, op.cit., p. 127.

eighth or ninth grade reading levels would probably present serious problems.⁴ The students are assembled in one place during the regular testing time at the beginning of Autumn quarter which facilitates the handling of the group. For the purposes of this study, it was necessary to distribute the tests during a class period at the end of Spring quarter when the pressures of the academic endeavor are more apparent. Most of the students completed the test at home, but of the 158 tests distributed, only eighteen failed to return it to their instructor.

One of the original purposes of this study was to show the counseling possibilities of a knowledge-interest test by determining the correlation between the interest pattern of nursing students and that of students in the Home Economics and Elementary Education curricula. As the study progressed, however, it was evident that an investigation of this sort was becoming involved and would not allow adequate treatment of the other two purposes which were felt to be of more importance: (1) to determine the extent to which knowledge and interest combine as a prognosticator of a beginning college nursing student's course of study and successful choice of field, and (2) to indicate interests that are specific to the academically-competent nursing student that are lacking in the average or failing student. By deleting the aforementioned purpose, the sample of students was decreased to the nursing group alone, or sixty-five girls. Since the test had been given to the entire group, composed of girls in the three different curricula, and the data collected and partially analyzed, the results of this work are included in the paper and may be found in the

⁴Ibid., p. 382.

Appendix E, page fifty-six.

The sample. The Miller Knowledge-Interest Test was given in May, 1960 to a group of 158 Freshman women who had taken this same test upon entrance into college the previous Autumn quarter of 1959. Transfer students, upperclass students enrolled in Freshman courses, girls who had dropped from school during the year and then reapplied, or girls who had entered school in any ensuing quarter other than Autumn were not included in the sample. As mentioned above, the original sample was comprised of women students from three curricula, Elementary Education, Home Economics, and Nursing.

Each set of tests from Autumn quarter, 1959 and Spring quarter, 1960 was scored individually. The first materials indicated that there were established categories to which each different curriculum subscribed and according to the number of course subject preferences and rejections a student indicated, it was determined which curriculum he would find most interesting. Similarly, the score for the nursing student was determined by the number of definite preferences for certain course subjects as well as the number of definite rejections.

The development of the hypothesis. To serve the purpose of differentiating between the academically-competent, average, and failing nursing student, this same test was again scored on the basis of a diversity of course subject preferences which the investigator felt would best accomplish the separation. These additional seventeen course subject preferences are listed in Chapter I, page fourteen, and deal with government, economics,

education, philosophy, psychology and the physical sciences.

Tyler considers interests as motivating forces. ". . . interests tend to focus behavior in particular directions rather than in others and as such are powerful determiners of the kind of person anyone is."⁵ The belief was set forth that the person who displayed keen mental abilities would be inquisitive about much that is going on around him, and that his interest in various areas would tend to focus his behavior in that direction. Or, as in the case of the academically-competent nursing student, her interest in current world affairs, educational trends, and other conditions affecting nursing would prompt her to develop this interest by preferring a variety of course subjects. Many students interested in the nursing profession are aware of the part that more and more nurses are taking in filling administrative and teaching jobs. With this realization and intent, it was believed that the academically-competent student would display interests pertinent to these fields.

The average student although indicating a definite interest in nursing subjects and an awareness of her environment, might not have the appetite for knowledge that the academically-competent student manifests. Therefore, while there might be an interest in current affairs, it might not be as mature as the competent student and may take longer to develop, thus prompting her to give an Indifferent answer to those areas where the competent student specified Likes. Learning experiences encountered in the hospital and accompanied by satisfaction in their achievement may encourage

⁵Ralph W. Tyler, Basic Principles of Curriculum and Instruction (Chicago: University of Chicago Press, 1950), p. 51.

the average student to develop interests in these activities. Tyler believes that "if the school situations deal with matters of interest to the learner he will actively participate in them and thus learn to deal effectively with these situations."⁶

The potentially-failing student may have several reasons for attending college and for choosing nursing as her profession. The motivation behind this cannot be determined and while she is considered a potential failure in nursing, she may be successful in another field. Her choice of course subjects from the Miller test may be based on what she thinks she should select such as those obviously dealing with care of patients and other specific areas of nursing. Referring again to Tyler, he states⁷ that the effectiveness with which a learner handles present situations determines his ability to meet new situations as they arrive. In the case of a student who showed many Dislikes for many areas of learning, it would seem apparent that she is not yet ready to handle situations and assume the responsibility that is present in attending college under her present curriculum.

Consideration of these factors contributed toward the formulation of the hypothesis which states that by determining interest patterns of students in the nursing curriculum, it will be possible to significantly improve the accuracy of predicting success in the curriculum. Furthermore, the academically-competent nursing student will exhibit a more varied and consistent pattern than the average or potentially-failing student. One

⁶Ibid., p. 8. ⁷Ibid.

of the tenets of this study is that the Knowledge-Interest test has a more keen discrimination than the Placement test in determining the probability of a nursing student being academically-competent, average, or failing.

Testing the hypothesis. Unlike the original system of using both preferences and rejections to determine a score, the system used for scoring on the seventeen additional items (the Discriminating Score) was based only on definite preferences. Therefore, while the first scoring number of the test included both Likes and Dislikes, the second scoring number was the Likes only of these seventeen course subjects.

From the Placement test scores and indices⁸ the Probable Achievement Stanine for Nurses was obtained for each student and indicated the probable achievement in the nursing curriculum. In some cases, the scores designated fields other than nursing where a higher level was attained.

Student records from Autumn quarter of 1959 through Winter quarter of 1961 were examined as an indication of the number of students who remained in the curriculum. They were also useful in determining the grade point average to be considered as a possible deterrent or conducement to academic success. The grade point average was obtained for each quarter through Autumn, 1960.

Limitations of the study. The fact that this report involved

⁸The Testing and Counseling Service at Montana State College, in their research, have determined the statistical weights which, applied to Freshman Placement tests and high school rank, result in the predictive stanine used for nurses.

Unpublished research, Testing and Counseling Service, Montana State College, 1959.

Freshmen women through their first year only in preference to other groups introduces certain limitations to the study. One such limitation is the use of the grade point average as the criterion for success. As was previously mentioned, it was felt that on the college level, the amount of success in a vocation is directly dependent on the success of the individual's academic preparation. Another limiting factor is that of using two tools, the Miller test and the Placement test, to predict this success. The motivation behind the students' actions was not investigated so that the actual reason for their success or failure is not known. Many may have failed or dropped out because of lack of interest or knowledge, but perhaps because of personal problems, finances, health and similar conditions.

A limitation of the Miller Test itself may be in the use of the course subject titles referred to in the test. These titles may not communicate the same thing to every reader, and some students may indicate a preference for a subject without the realization of what it consists.

CHAPTER III

ANALYSIS OF THE DATA

There was one principal instrument involved in the data collection for this report, the Miller Knowledge-Interest Test. The Placement test results were used as a criterion for comparison and these two were supplemented by examination of the findings from the student records which offered each girl's grade point average for the quarter or at her termination, if she had discontinued.

As soon as each of these records had been reviewed for the necessary information, the data was collected and organized so that its contents could be drawn upon at the appropriate time. After all the material was gathered, the separate quantities of information were reduced to a workable size and incorporated into one large table from which some analysis of the findings could be made.

Each of the sixty-five students was assigned a number to preserve anonymity and her various scores and grade point averages were arranged in order. This information was organized in such a way as to test the first portion of the hypothesis which states that: by determining the interest patterns of nursing students, it will be possible to significantly improve the accuracy of predicting success in the nursing curriculum.

The data showing the student's Placement test score in relation to her Knowledge-Interest test score and grade point averages are presented in Appendix B, page forty-seven. There were nine girls who did not repeat the second Knowledge-Interest test. This will affect that part of the

report in which it is determined if the interest level throughout the year was modified. However, it will not affect the analysis concerning the first Knowledge-Interest score and the first Placement test score, the only two scores one would normally have for the student upon her college entrance.

Table I shows that of the sixty-five students in this study, there were sixteen who dropped from school. Most of these sixteen girls discontinued at the end of Spring quarter, 1960, just before they were to have entered the clinical nursing courses. The motivation behind this drop is not known and has been indicated previously as a limitation of the study. In most cases it would appear that the drops were due to poor grades. Students #44, 59, 62, and 64 maintained a passing average throughout the year and apparently dropped for reasons other than grades. With the exception of #44, who placed in the middle range on both tests, the Placement and K-I scores indicated that these students would achieve little academic success. The one girl who repeated the second K-I test showed less interest than at the start of the year.

Most of these sixteen students rated average or below on their Placement test scores. The two who ranked in the high group on the Placement test showed average and low interest in nursing. On the Knowledge-Interest test, there were four who indicated a high interest in nursing but who had low Placement scores. Student #54 had a high K-I score but received the lowest score possible on the Placement test and maintained less than a "D" average throughout the year. However, #62 and 64 received low Placement scores and medium and low K-I scores respectively, yet they were two of the four students who received passing grades throughout the year.

TABLE I

COMPARISON OF GRADE-POINT AVERAGES WITH PLACEMENT AND INTEREST TEST
SCORES FOR SIXTEEN STUDENTS WHO DROPPED FROM
THE NURSING CURRICULUM

Stud. No.	Place. Score	1st K-I* Fall '59	GPA Fall '59	GPA Win.'59	2nd K-I Spr.'60	GPA Spr.'60	GPA Sum.'60
2	7	11	1.56	1.70	19	1.88	drop
10	5	16	1.50	1.81	16	2.17	drop
15	5	18	2.36	----	14	----	drop
17	7	15	2.01	1.74	13	1.68	drop
26	5	16	2.00	1.66	9	1.61	drop
27	4	15	1.40	0.71	15	0.74	drop
30	4	17	1.64	1.51	19	1.74	drop
35	4	18	----	----	12	----	drop
38	4	16	2.04	1.63	16	1.78	drop
44	5	14	2.30	2.33	10	2.13	drop
54	1	18	0.62	0.38	18	0.44	drop
58	4	16	0.88	drop			
59	4	16	2.59	2.35	--	2.17	drop
62	3	16	2.33	2.30	--	2.26	drop
63	3	13	1.25	1.32	--	0.92	drop
64	3	11	2.61	2.20	--	drop	

*K-I - Knowledge-Interest Test
GPA - Grade Point Average

NOTE: The Ranks for the Placement test and K-I test are:

<u>Placement Test</u>	<u>K-I Test</u>
High - 7,8,9	High - 17,18,19,20
Average - 4,5,6,	Medium - 12,13,14,15,16,
Low - 1,2,3,	Low - Below 12

It would appear that most of these girls should have succeeded in nursing, yet it would be impossible to predict accurately a withdrawal from school on the basis of these scores because the student's outside motivation is an unknown factor and cannot always be tested.

From the total group of nursing students studied, there were forty-one (63 per cent) who indicated a high interest in nursing on the K-I test. Thirteen of these students showed high achievement levels on the Placement test. These thirteen girls retained their high interest in nursing as evidenced by the results of the second Knowledge-Interest test. On the Placement test, the Nursing score was the highest or among the highest that each girl had received, indicating that she had probably chosen the right curriculum. The grade point average in each case was consistent throughout the year and there were no withdrawals in this group. This indicated that it would have been possible to predict academic success on the basis of high scores on both the Placement and K-I test results.

Out of this group of forty-one students displaying a high K-I score, there were twenty-three (35 per cent) who placed in the average range of 4, 5, and 6 on the Placement test. And ten of these girls received a nursing score on the Placement test which was their lowest or among the lowest, suggesting that nursing may not have been the field in which they would find most success. Only two of these students whose nursing achievement score was low withdrew from school after receiving cumulative grade point averages of 1.76 and 1.84 respectively, implying that grades were the reason for leaving. This finding means that it may also be practicable to predict academic success on the basis of average

achievement scores plus high interest scores.

Of the group (forty-one students) showing a high interest in nursing, five (8 per cent) showed low achievement scores on the Placement test, indicating a poor prognosis for success in the nursing curriculum. Three of these students received a nursing score on the Placement test which was their lowest grade received. However, none withdrew from school and one girl had a cumulative grade point average of 2.92 at the end of the year. Of the total group of five girls, one student dropped after a cumulative grade point average of 0.48. However, in reference to Table I, there were four girls who dropped from school with a history of low achievement scores on the Placement test, two of whom had a low grade point average for the year. Three of the students, who were absent at the time it was given, did not repeat the second interest test, but the three who did had maintained or increased their interest in nursing. Apparently they were still responding to their interest of course subjects in the nursing curriculum but were unable to compete academically. This finding concerning these five students indicates that a low achievement score on a Placement test accompanied by an average or low interest score may be of value in predicting academic failure. Concerning the potentially-failing student, it would seem that a low achievement score on the Placement test may give a more accurate method of predicting academic failure than the K-I scores which show interest but not ability. There is the question of whether five students is an adequate sample from which to make these generalizations.

The interest test as a discriminating tool. Using the grade point

average as the criterion for success, an attempt was made to determine if the Knowledge-Interest test had a more keen discrimination than the Placement test for distinguishing between the academically-competent, average, and potentially-failing nursing student. The belief was set forth in Chapter II that the academically-competent student would have an active interest in current world affairs, educational trends and other conditions affecting nursing would prompt her to develop this interest by preferring a variety of course subjects. On the other hand, the average student, although indicating a definite interest in nursing subjects and an awareness of her environment, might not have the appetite for knowledge that the academically-competent student manifests. She might tend to give an Indifferent answer to those areas where the competent student specified Likes. The potentially-failing student might very likely show many Dislikes for many areas of learning and yet, although she is considered a potential failure in nursing, she may be successful in another field.

The group of sixty-five students was divided into three categories, depending upon their grade point average for the year, Appendix C, page fifty. Each of these groups was then studied to determine if the seventeen additional items concerned with government, economics, education, philosophy, psychology and the physical sciences, as described in Chapter I, page fourteen, had any value in predicting the amount of their academic success. The discriminating score is made up only of the Likes of the students concerning the seventeen additional items. Therefore, the Indifferent and Dislike answers would have the same value as far as their effect on the final score. Although the grade point average for the year was used as a guide and

criterion, only the first interest test was used in this analysis since it would normally be the only available tool. However, for comparison, the results of the second Knowledge-Interest test are included in Table II along with the original K-I and Discriminating scores and the Placement test results. These students had first been assigned a number at random and then categorized as to grade point average. The first two in each category were selected for examples in Table II.

Student #1 in the 3.0 - 4.0 grade point category, was high in achievement on the Placement test. Her first K-I score was high-average but the Discriminating score was low-average with her preferences being the Physical Sciences inclusive. The test showed Indifferences for every other course subject with the exception of Education, for which she showed a Dislike answer in each area. Her score was higher on the second K-I test and on the discriminating group of subjects and she maintained her Like of Physical Sciences with the addition of Philosophy and Psychology for which she had previously indicated Indifference. Her Dislike of Education did not change. Student #20 in the same category showed virtually the same scores but had more preferences and she showed Likes of Government and Psychology on the first taking of the test. However, her second Discriminating score was low in preferences and she showed many Indifferences to course subjects for which she had previously indicated Likes. The Indifferent answers indicated at the beginning of a student's college career may show that she realizes her limitations as far as understanding the content of the course. On the other hand, too many Indifferent or Dislike answers may indicate that the student does not have the eagerness or motivation to learn, a disting-

TABLE II

THE RELATION OF THE INTEREST TEST DISCRIMINATING SCORES TO THE
ORIGINAL INTEREST TEST SCORES AND ACHIEVEMENT LEVELS

Stud. No.	Place. Score	1st K-I Fall '59	Disc.* Fall '59	Pref.* Fall '59	2nd K-I Sp.'60	Disc. Sp.'60	Pref. Sp.'60
<u>3.0-4.0 Grade Point Average</u>							
1	8	16	7	Phys.Sc.	20	10	Phys.Sc. Psychol. Phil.
20	7	16	7	Phys.Sc. Govt. Psychol.	13	4	Govt. Psychol.
<u>2.0-3.0 Grade Point Average</u>							
3	5	20	14	Phys.Sc. Phil, Ed, Psychol.	18	10	Econ, Ed. Govt., Psychol.
5	7	18	7	Phys.Sc. Psychol.	16	6	Phys.Sc. Psychol. Econ.
<u>Below 2.0 Grade Point Average</u>							
2	7	11	4	Psychol.	19	6	Econ. Govt. Psychol.
11	5	16	4	Psychol.	16	8	Govt. Psychol.

*Disc. - Discriminating Score

Pref. - Preferences

NOTE: The Ranks for the Discriminating Score are:

High - 14,15,16,17

Medium - 6,7,8,9,10,11,12,13,

Low - Below 6

uishing factor between competent and failing students. A student with a high Placement and Interest score who indicates an average number of definite course subject preferences and some Indifferent answers but with few Dislikes may have a strong prognosis for being academically successful. This finding may also indicate that a student's Discriminating score has no real value by itself but must be coupled with the K-I and Placement test results in order to distinguish between the academically-competent, average, and failing student. The academically-competent and average students prefer the Physical Sciences on both tests and have comparable scores in all columns. This may mean that there can be no real distinguishing feature between the academically-competent student and the average student that can be determined at the beginning of their college career. The potentially-failing student tends to show little interest in the Physical Sciences and displays many Indifferent and Dislike answers, Appendix D, page fifty-three. The data in reference to the individual difference in preference of these seventeen additional course subjects areas appears in Appendix D, but because of student quantity only the first half of the 2.0 - 3.0 grade point average group was studied for this particular feature.

The academically-competent student's interest in the Physical Sciences is more consistent than her preference for other course subjects. Since it is also evident that the average student maintains interests close to this same pattern, discrimination on the basis of these seventeen additional items between the average student and the academically-competent student is not feasible. However, it may also be that there is no real importance in trying to determine a marked difference between the interests

of the two groups as far as predicting academic success is concerned. A student who maintains average marks is reasonably successful academically and has the same opportunity as the academically-competent student for becoming a good nurse. It would be of more benefit to know the interest pattern which distinguishes the potentially-failing student so that she could be counseled into a more appropriate curriculum. It is entirely possible that the potentially-failing student will have a great interest in certain course subjects on her first exposure to the test and as a beginner in college. Whether she is capable of surviving the courses may be determined best by matching this interest score with the achievement score and predicting from there. Apparently these course subjects which were used to discriminate between the three academic levels hold equal interest for all three groups. There was evidence denoting the change of interests over the course of one year between the three groups, but this would be of no benefit in predicting the success of the beginning student.

Consistency of interests during one school year. Although it would be of no consequence in predicting academic success, the consistency with which the academically-competent student retained her interest in various course subjects throughout the school year was of interest, and also how this pattern contrasted with that of the potentially-failing student.

The academically-competent student indicated virtually the same preferences at the end of the year as at its beginning, including her preferences for the Physical Sciences. Many of the subjects she had disliked on the first test were marked as either liked or indifferent to on the second test. The potentially-failing student's reaction was more pro-

nounced. Where she had indicated her Like of Physical Sciences on the first testing, on the second test their preference had been changed to Indifferent or Dislike. Table III contains the results of the second test and shows the difference in consistency of interests between the two groups during one school year. In a few cases, the student still had an active interest in the Physical Sciences but her grade point average would indicate that she had met with no academic success in fortifying this interest. Another study may determine the reason for their continued interest but lack of achievement.

Discounting a student's motivation, the nursing students who place high in achievement on the Placement test and who have a high interest score are the ones to whom can safely be assigned future academic success. The students who place average in achievement and high on interest can also be expected to achieve academic competency. However, there would tend to be concern over the student who placed average on both the K-I and Placement test results. The grade point average, in this case, has a tendency to go down and there are several Drops from this group. In the realm of low achievement scores, the Placement test seems to be of more benefit in predicting academic success than the interest test.

There seems to be little basis on which to differentiate between the academically-competent, average, or failing nursing student by the use of a Discriminating score using the course subjects on the K-I test concerned with government, economics, education, philosophy, psychology, and the physical sciences. The average and academically-competent students indicated virtually the same preferences while the potentially-failing student

TABLE III

DIFFERENCE IN CONSISTENCY OF INTERESTS BETWEEN THE
ACADEMICALLY-COMPETENT AND FAILING STUDENT
AT THE END OF ONE SCHOOL YEAR

Stud. No.	Like	Dislike	Indifferent
<u>3.0-4.0 Grade Point Average</u>			
1	Phys.Sc., Phil.,	Government	Econ., Education
20	Govt., Psychol.		Econ., Phys.Sc., Ed., Philosophy
22	Phys.Sc., Govt. Phil., Psychol.		Economy Education
26	Phys.Sc. Psychology	Economy Government	Phys.Sc., Ed., Philosophy
30	Psychology	Econ., Phys.Sc.	Ed., Govt., Phil.
35	Econ., Ed., Phil., Govt., Psychology	Phys. Sciences	
<u>Below 2.0 Grade Point Average</u>			
2	Econ., Govt., Psychology	Phys.Sc., Philosophy	Education
18	Govt., Psychol.		Econ., Phil., Ed., Physical Sciences
28	Psychology	Phys. Sciences	Econ., Phil., Ed., Government
39	Govt., Psychol.	Education	Phys.Sc., Econ., Philosophy
42	Psychology	Phys. Sciences	Econ., Ed., Govt., Philosophy
56	Econ., Psychol. Phys.Sc., Govt.		Education Philosophy

showed a somewhat different picture, but the difference was not marked enough to insure separation and allow for prediction of future academic competency. It was shown by comparison of these additional items the degree to which the academically-competent student maintains a consistent interest pattern in contrast to the failing student.

CHAPTER IV

SUMMARY

There are many areas open for research in the nursing profession, all of which are ultimately designed to improve nursing care. This study originated with the idea that there should be a way in which some of the qualities of the nurse candidate could be assessed before she entered the school of nursing curriculum, making it possible for constructive counseling to be done after her nursing potential was determined.

There are various tests available to evaluate the applicant's previous preparation for college and to determine her scholastic ability. There are also tests designed to measure the individual's interest in different occupations and fields, thereby identifying the field or fields in which she will find most success.

The usual method by which interests of individuals have been measured, and their vocational success predicted, has been through the use of tests containing situational problems or areas of basic vocational preferences. Tests such as these have been used extensively in schools of nursing throughout the country and are used for the purpose of predicting vocational success only. This paper attempted to show the merit of using a different type of inventory based on the individual's interest in knowledge of course subjects offered on the collegiate level. Through the use of this inventory, the prediction of academic success in campus level courses should be possible. These findings would supply more rational basis for judgment of whether or not the student will be capable of completing course requirements

which are prerequisites to the hospital portion of the program and successful completion of her preparation to become a competent nurse.

I. SOURCES

The problem investigated in this study was that of determining whether a beginner in the nursing profession can be effectively tested in such a way that the scores will predict success in the curriculum.

The primary source of material was the Knowledge-Interest Test and comments made about it by the author, A.W. Miller. He contends that a reliable measure of interest can be developed which gives distinct interest patterns. These patterns fit the successful individual in different curricula with a different pattern for each curriculum. When such a reliable measure of interest is developed, then the accuracy of predicting success in the different curricula will be significantly improved over the present system based on scholastic aptitude and achievement tests. Other primary sources of material, aside from the results of this interest test, were the results of the Placement test and the information taken from the student records.

The secondary source of material was from a review of literature to gain more information in regard to the amount of work done along this particular line of testing. In the realm of interest testing, Strong and Kuder have contributed much in the way of predicting vocational success. Dr. Strong devised a Vocational Interest Blank whose chief purpose is to show a person the extent to which his interests correspond to those of successful men and women in a variety of occupations. In reference to vocational

success, the use of the Strong Blank is more pronounced in the life insurance field where a definite correlation of test scores and success is shown. Less research has been done on the women's blank so that the test for men has been advocated for prospective women applicants. However, in predicting academic success, authorities state that the Vocational Blank does poorly what an intelligence test or scholastic aptitude test can do much better.

G. Frederick Kuder originated another well-known instrument that provides scores for a number of basic preferences. His test, like Strong's is primarily intended for vocational guidance and is geared to the younger student and the one who has not yet determined his professional career. It leads the student to consider a general field of interest such as the Physical Sciences without concern as to whether this career will be specifically in Chemistry, Physics, or allied fields. Therefore, the use of these records to obtain data on a student's potential academic achievement is of limited value.

II. METHOD

The Miller Knowledge-Interest Test was administered at the end of Spring quarter, 1960 to a group of 158 Freshman women who had taken this same test upon entrance into college the previous Autumn quarter of 1959. Transfer students, upperclass students enrolled in Freshman courses, girls who had dropped from school during the year and then reapplied, or girls who had entered school in any ensuing quarter other than Autumn, 1959 were not included in the sample. This original group was comprised of women

from three different curricula, Elementary Education, Home Economics and Nursing, to serve one of the original purposes of the study which was to show the counseling possibilities of a knowledge-interest test. This would be done by determining the correlation between the interest pattern of nursing students and that of students in the other two curricula. As the study progressed, however, it became apparent to the investigator that this purpose was becoming involved and was not allowing adequate treatment of the other two purposes which were felt to be of more importance since they had a more direct relation to nursing students. By deleting this one purpose and decreasing the group to nursing students alone, the sample was reduced to sixty-five girls.

The Miller tests from Autumn, 1959 and Spring, 1960 were scored individually to meet two requirements:

1. To determine the students' interest in the Nursing curriculum;
2. To differentiate between the academically-competent, average, and potentially-failing student.

The score from each of these ratings was given a grade of high, middle, and low; and those in turn were compared with scores received on the Placement test and with the grade point average from the student records.

In many instances the amount of success in a vocation is directly dependent on the extent of the individual's academic preparation. It was recognized that high academic achievement does not necessarily represent the best nurse. Nevertheless, the academic standing was chosen as the criterion because the test was being used as a tool in predicting academic success. There are certain academic requirements set up before the nursing student can enter the hospital portion of the program.

III. RESULTS

The information received from the three instruments verified the first part of the hypothesis which states that by determining the interest pattern of nursing students, it should be possible to significantly improve the accuracy of predicting academic success, now based largely on intelligence tests. The Placement test alone was of limited use as a discriminating tool, but the Placement test and Knowledge-Interest test combine as an accurate predictor.

The Knowledge-Interest test does not have a more keen discrimination than the Placement test for distinguishing between the academically-competent, average, and failing nursing students. It was also determined that the interest test alone was of limited value in predicting academic success since many who had failing grades or had withdrawn from school revealed a high degree of interest in nursing.

In the area of low achievement scores, the Placement test may give a more accurate method of predicting academic success than the K-I scores which show interest but not ability. In this particular study, there is the question of whether five students is an adequate sample for the potentially-failing student. However, one-half of the students with low achievement levels withdrew from school or else had received failing grades. These same girls had a high interest score on the Knowledge-Interest test.

IV. LIMITATIONS

The use of the grade point average as the criteria for success may be considered a limitation of the study. However, unless the grade point

average is maintained at a standard level, the nursing student may not continue in the curriculum. Therefore, the grade point average was chosen as the criterion because the test was being used as a tool in predicting academic success. If this study, using the same students, was carried through their hospital training, the grade point average would still remain the best criteria for success. Only when the graduate students begin their professional career does this criterion change to one adapted to vocational success.

Student motivation was not investigated so that the actual reason behind success or failure is not known. So many variables can enter at this point such as personal and financial problems, increased social activity and factors of health that it is impossible to establish the cause and effect. Whether or not the motivation behind an act can be determined certainly limits the findings of a study such as this. Another limiting factor is that of confining the study to the results of two tools, the Miller Knowledge-Interest Test and the Placement Test. A limitation of the Miller Test itself may be in the use of course subject titles that may not communicate the same thing to every reader.

V. RECOMMENDATIONS

This study could be carried on into the clinical nursing courses to determine the final academic achievement of the students in relation to their college placement score and their interest score. It can be speculated that as the interests of the nursing students are satiated, their academic ability will increase and newer interests will arise.

This Miller Knowledge-Interest Test has meaningful implications in

the realm of counseling when used with the results of the Placement test. Students displaying a low Placement score and a high interest score may be effectively counseling into non-professional nursing where their interest would be developed and the amount of formal education or theory limited. Another counseling possibility is indicated concerning the student with a low-average Placement test score and a low-average K-I score. This study introduces the question of whether these girls will continue in their same pattern and receive lower grade point averages in the hospital. There may be an increase in academic ability demonstrated there because of a closer working relationship with nursing.

APPENDIX A

KNOWLEDGE-INTEREST TEST

In planning college courses, it is important to consider the interests of students who might attend the courses. Consequently, this test was prepared to give new students an opportunity to indicate their interests in many of the subjects taught at this college.

Below is a list of subjects. Some of these you will be required to study, and the others you will study only if you choose to do so. Read the subjects one at a time.

Mark the answer sheet under the letter L if you think you will Like or be interested in studying the subject.

Mark the answer sheet under the letter I if you are Indifferent about studying the subject or if you don't know what the subject is about.

Mark the answer sheet under the letter D if you Dislike or think you would not be interested in studying the subject.

Blacken only one space on the answer sheet for each numbered subject. You must make a choice by answering each item.

L - Like or will be
interested in

I - Indifferent or don't
know

D - Dislike or will
not be inter-
ested

- | | |
|---------------------------------|-----------------------------|
| 1. Abnormal Psychology | 21. Artificial Insemination |
| 2. Acetylene and Arc Welding | 22. Astronomy |
| 3. Acting (Theatre) | 23. Athletic Conditioning |
| 4. Adult and Young Farmer Prog. | 24. Atomic Physics |
| 5. Air Force Science | 25. Auditing |
| 6. Agricultural Economics | 26. Auto Mechanics |
| 7. Agricultural Education | 27. Bacteriological Prin. |
| 8. Agricultural Prices | 28. Baseball |
| 9. Algebra | 29. Beef Production |
| 10. American Economy | 30. Biochemical Methods |
| 11. American History | 31. Building Houses |
| 12. Anatomy of Domestic Animals | 32. Building Materials |
| 13. Ancient Civilizations | 33. Business Correspondence |
| 14. Animal Breeding | 34. Business Law |
| 15. Animal Genetics | 35. Cabinet Making |
| 16. Animal Industry | 36. Calculus |
| 17. Animal Nutrition | 37. Camera Techniques |
| 18. Apprec. of Architecture | 38. Care of Patients |
| 19. Architectural Drawing | 39. Carpentry and Constr. |
| 20. Architectural Theory | 40. Cattle Nutrition |

APPENDIX A (continued)

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|---|---------------------------------------|
| 41. Chem. Comp. of Microorganisms | 84. First Aid |
| 42. Chemical Engineering | 85. Football |
| 43. Child Development | 86. French (Language) |
| 44. City Planning | 87. General Chemistry |
| 45. Classification and Ident. of Plants | 88. General Farm Crops |
| | 89. General Military Science |
| 46. Coaching Athletics | 90. General Physics |
| 47. Community Health | |
| 48. Comm. Landscape Design | 91. Geometry |
| 49. Comm. Mental Hlth. Prob. | 92. German (Language) |
| 50. Control of Comm. Diseases | 93. Govt. of the U.S. |
| | 94. Gymnastics |
| 51. Counseling Techniques | 95. Heating and Air Cond. |
| 52. Crop Prod. and Improvement | |
| 53. Cultures for Bact. Growth | 96. Highway Engineering |
| 54. Current Ed. Trends | 97. Hist. of Architecture |
| 55. Debating | 98. Hist. of Civilization |
| | 99. Hist. of Mathematics |
| 56. Design for Farm Bldgs. | 100. Hist. of Teaching |
| 57. Digital Computers | |
| 58. Diseases of Dom. Animals | 101. Home Furnishing |
| 59. Drama | 102. Home Management |
| 60. Drawing and Design | 103. Horse Management and Training |
| | 104. House Planning |
| 61. Drawing and Perspective | 105. Household Equip. |
| 62. Dress Design | |
| 63. Ed. Problems | 106. Human Behavior |
| 64. Elect. Circuits and Mach. | 107. Human Learning |
| 65. Elect. Equip. of Bldgs. | 108. Human Motivation and Personality |
| | 109. Hydraulic Engineering |
| 66. Electricity and Magnetism | 110. Industrial Crafts |
| 67. Electromagnetic Theory | |
| 68. Electronic Devices | 111. Industrial Management |
| 69. Electronics (Theory) | 112. Industrial Mathematics |
| 70. Embryology | 113. Internal Comb. Mach. |
| | 114. Insurance and Invest. |
| 71. Engineering Contracts | 115. Irrigation Practices |
| 72. Engineering Drawing | |
| 73. Entomology | 116. Life Drawing |
| 74. Evolution | 117. Livestock Judging |
| 75. Exper. Stress Analysis | 118. Logic |
| | 119. Machine Design |
| 76. Family Clothing Prob. | 120. Machine Shop |
| 77. Family Relations | |
| 78. Farm Machinery | 121. Manufacturing Cost Anal. |
| 79. Farm Management | 122. Materials Testing |
| 80. Fashion Illus. | 123. Medical-Surg. Nursing |
| | 124. Mech. of Materials |
| 81. Feeds and Feeding | 125. Merchandising |
| 82. Field Geology | |
| 83. Financing Agriculture | |

APPENDIX A (continued)

- | | |
|---------------------------------|-------------------------------------|
| 126. Micro. and Human Disease | 170. Sculpture |
| 127. Microwave Principles | 171. Seed Ident. and Grading |
| 128. Mineralogy | 172. Shakespeare |
| 129. Mont. Geog. and Resources | 173. Sheep Production |
| 130. Montana School Laws | 174. Shop Drawing |
| 131. Motion Picture Direction | 175. Shorthand |
| 132. Motors and Tractors | 176. Short Story Writing |
| 133. Newspaper Writing | 177. Social Problems |
| 134. Novels | 178. Soil Class. and Survey |
| 135. Nuclear Physics | 179. Soil Conservation |
| 136. Nutrition | 180. Soil Fertility and Fertilizers |
| 137. Obstetrical Nursing | 181. Spanish (Language) |
| 138. Office Machines | 182. Stagecraft |
| 139. Office Procedures | 183. Statistics |
| 140. Oprics (Theory) | 184. Structural Design of Buildings |
| 141. Organic Chemistry | 185. Study of the Blood |
| 142. Personnel Management | 186. Study of Fungi |
| 143. Personnel Work | 187. Surveying |
| 144. Philosophy | 188. Swine Production |
| 145. Phil. of Teaching | 189. Tailoring |
| 146. Physiological Chemistry | 190. Teaching Science |
| 147. Physiological Psychology | 191. Teaching Methods |
| 148. Plant Diseases | 192. Theory of Investments |
| 149. Plant Nutrition | 193. Theory of Team Games |
| 150. Play Prod. (Theatre) | 194. Thermodynamics |
| 151. Poetry | 195. Track and Field |
| 152. Prep. of Foods | 196. Trigonometry |
| 153. Prin. of Accounting | 197. Water and Oil Painting |
| 154. Production Engineering | 198. Weed Control |
| 155. Prob. of Elementary Educ. | 199. World Literature |
| 156. Psychiatric Nursing | 200. Zoology |
| 157. Public Finance | |
| 158. Public Health Nursing | |
| 159. Public Speaking | |
| 160. Purposes of Public Schools | |
| 161. Radio and T.V. Announcing | |
| 162. Range Management Prac. | |
| 163. Range Production | |
| 164. Range Surveys and Plans | |
| 165. Religion | |
| 166. Rural Land Appraisal | |
| 167. Russian (Language) | |
| 168. Salesmanship | |
| 169. School Curr. Develop. | |

APPENDIX B

PLACEMENT TEST SCORE IN RELATION TO THE KNOWLEDGE-INTEREST SCORE
AND GRADE POINT AVERAGES FOR ONE YEAR

Stud. No.	Place. Score	1st K-I* Fall '59	GPA Fall '59	GPA Win. '59	2nd K-I Spr. '60	GPA Spr. '60	GPA Sum. '60
1	8	16	3.27	3.10	20	3.45	3.45
2	7	11	1.56	1.70	19	1.88	drop
3	5	20	2.85	2.40	18	2.17	2.00
4	—	15	2.17	2.71	14	2.11	drop
5	7	18	2.19	2.39	16	2.40	2.50
6	7	18	2.97	2.90	20	2.91	3.11
7	*5	14	2.12	2.60	15	2.40	2.72
8	*5	13	2.44	2.65	18	2.72	2.74
9	4	20	2.67	2.34	17	2.23	2.22
10	7	19	3.0	2.82	17	2.71	2.86
11	5	16	1.50	1.81	16	2.17	drop
12	6	15	2.0	2.09	16	2.14	2.18
13	5	20	2.56	2.41	18	2.37	2.52
14	7	18	1.79	1.84	18	2.09	2.21
15	7	17	2.85	2.03	16	2.11	2.25
16	5	18	2.36	withheld	14	withheld	drop
17	*6	18	2.21	2.65	16	2.05	2.18
18	7	15	2.01	1.74	13	1.68	drop
19	*4	18	2.49	2.00	19	2.11	2.28

* Indicates the lowest or among the lowest score received.

NOTE: The Ranks for the Placement Test and the K-I Test are:

Placement Test
 High - 7,8,9
 Average - 4,5,6,
 Low - 1,2,3,

K-I Test
 High - 17,18,19,20
 Medium - 12,13,14,15,16,
 Low - Below 12

APPENDIX B (continued)

Stud. No.	Place. Score	1st K-I Fall '59	GPA Fall '59	GPA Win.'59	2nd K-I Spr.'60	GPA Spr.'60	GPA Sum.'60
20	7	16	3.25	3.15	13	3.0	3.10
21	6	18	3.43	3.73	15	3.67	3.66
22	*4	17	2.31	1.94	18	2.02	2.15
23	*5	16	2.83	2.67	20	2.72	2.92
24	6	18	2.43	2.37	19	2.46	2.58
25	8	19	2.56	2.80	16	2.78	2.83
26	6	16	3.31	3.23	11	3.27	3.26
27	5	16	2.0	1.66	9	1.61	drop
28	4	15	1.40	0.71	15	0.74	drop
29	7	20	2.0	2.21	18	2.24	2.34
30	6	19	3.29	3.43	16	3.65	3.55
31	*4	17	1.64	1.51	19	1.74	drop
32	7	17	2.56	2.69	15	2.43	2.37
33	7	15	2.0	2.35	11	2.45	2.41
34	5	18	2.5	1.85	19	1.72	1.68
35	9	19	3.12	3.09	18	3.14	3.17
36	*4	18	none	none	12	none	drop
37	7	15	2.37	2.91	11	2.94	2.93
38	6	20	2.31	2.27	20	2.2	2.26
39	4	16	2.04	1.63	16	1.78	drop
40	3	19	2.59	1.91	18	1.9	1.92
41	*6	14	2.2	2.34	16	2.44	2.38
42	5	19	2.41	1.96	17	1.89	1.74
43	6	16	2.11	2.11	18	2.51	2.67
44	5	20	2.42	2.4	19	2.24	2.29
45	5	14	2.3	2.33	10	2.13	drop
46	*4	20	2.43	1.56	14	1.68	1.75
47	5	19	2.0	2.15	16	2.22	2.25
48	5	17	2.55	2.17	18	2.14	2.16

APPENDIX B (continued)

Stud. No.	Place. Score	1st K-I Fall '59	GPA Fall '59	GPA Win. '59	2nd K-I Spr. '60	GPA Spr. '60	GPA Sum. '60
49	*6	19	2.5	2.30	17	2.08	2.23
50	*2	18	2.4	2.15	19	2.14	2.26
51	8	20	2.18	2.14	18	2.16	2.23
52	7	14	2.51	2.41	10	2.3	2.34
53	*6	18	2.79	2.79	14	2.72	2.74
54	8	20	2.81	2.82	18	2.77	2.83
55	1	18	0.62	0.38	18	0.44	drop
56	6	18	2.41	1.72	18	1.9	1.86
57	*6	18	3.15	2.76	none	2.78	2.87
58	7	17	1.8	1.5	none	1.82	1.98
59	*4	16	0.88	drop			
60	*4	16	2.59	2.35	none	2.17	drop
61	*3	19	3.25	2.38	none	2.78	2.84
62	*2	19	2.36	1.94	none	1.66	1.78
63	*3	16	2.33	2.3	none	2.26	drop
64	*3	11	2.61	2.2	none	drop	
65	*7	19	2.46	2.38	none	2.46	2.62

APPENDIX C

THE RELATION OF THE INTEREST TEST DISCRIMINATING SCORES TO THE
ORIGINAL INTEREST TEST SCORES AND ACHIEVEMENT LEVELS
ACCORDING TO THE GRADE POINT AVERAGES

Student Number	Placement Score	Disc.* Fall '59	1st K-I Fall '59	Disc. Spring '60	2nd K-I Spring '60
<u>3.0-4.0 Grade Point Average</u>					
1	8	7	16	10	20
20	7	6	16	4	13
21	6	6	18	11	15
26	6	9	16	5	11
30	6	10	19	4	16
35	9	9	19	13	18
<u>2.0-3.0 Grade Point Average</u>					
3	5	14	20	10	18
5	7	7	18	6	16
6	7	9	18	9	20
7	5	11	14	11	15
8	5	1	13	3	18
9	4	6	20	6	17
10	7	8	19	4	17
12	6	7	15	4	16
13	5	2	20	4	18
14	7	4	18	4	18
15	7	2	17	3	16
16	5	4	18	9	14
17	6	1	18	4	16
19	4	5	18	11	19
22	4	10	17	10	19
23	5	5	16	9	20
24	6	6	18	2	19

APPENDIX C (continued)

Student Number	Placement Score	Disc. Fall '59	1st K-I Fall '59	Disc. Spring '60	2nd K-I Spring '60
25	8	7	19	13	16
29	7	7	20	9	18
32	7	6	17	11	15
33	7	13	15	14	11
34	5	15	18	3	19
37	7	1	15	11	11
38	6	3	20	3	20
41	6	3	14	2	16
43	6	7	16	3	18
44	5	7	20	6	19
45	5	7	14	2	10
48	5	2	19	6	16
49	5	7	17	9	18
50	6	7	19	5	17
51	2	4	18	5	19
52	8	5	20	5	18
53	7	2	14	2	10
54	6	12	18	15	14
55	8	13	20	9	18
57	6	11	18	13	18
58	6	2	18	none	none
61	4	6	16	none	none
62	3	12	19	none	none
65	3	9	16	none	none
67	3	2	11	none	none
68	7	6	19	none	none
<u>Below 2.0 Grade Point Average</u>					
2	7	4	11	8	19
11	5	4	16	8	16

APPENDIX C (continued)

Student Number	Placement Score	Disc. Fall '59	1st K-I Fall '59	Disc. Spring '60	2nd K-I Spring '60
18	7	9	15	5	13
27	5	6	16	1	9
28	4	3	15	3	15
31	4	5	17	8	19
39	4	11	16	6	16
40	3	7	19	4	13
42	5	5	19	7	17
46	4	8	20	2	14
56	1	8	18	10	13
59	7	4	17	none	none
60	4	6	16	none	none
64	2	8	19	none	none

APPENDIX D

INDIVIDUAL DIFFERENCE IN PREFERENCES OF THE SEVENTEEN ADDITIONAL
COURSE SUBJECTS AS INDICATED ON THE FIRST
KNOWLEDGE-INTEREST TEST

Stud. No.	Like	Dislike	Indifferent
<u>3.0-4.0 Grade Point Average</u>			
1	Phys. Sciences	Education	Econ., Govt., Phil., Psychology
20	Phys.Sc., Govt., Psychology	Econ., Education	Philosophy
21	Govt., Phil., Psychology	Phys. Sciences	Econ., Education
26	Phys.Sc., Phil.	Economy	Govt., Education
30	Phys.Sc., Phil. Psychology	Government	Econ., Education
35	Phys.Sc., Phil. Psychology	Econ., Education	Government
<u>2.0-3.0 Grade Point Average</u>			
3	Phys.Sc., Ed., Psychol, Phil.		Econ., Government
5	Phys. Sciences Psychology	Education, Govt.	Econ., Philosophy
6	Phys.Sc., Econ. Govt., Psychol.		Philosophy, Education
7	Phys.Sc., Phil. Psychology		Econ., Govt., Ed..
8	Psychology	Phys.Sc., Econ., Ed., Phil., Govt..	
9	Phys. Sciences Psychology	Govt., Philosophy Education	Economics
10	Phys.Sc., Phil. Psychology		Econ., Govt., Ed..
12	Phys.Sc., Econ. Psychology	Psychology, Ed.,	Philosophy, Government

APPENDIX D (continued)

Stud. No.	Like	Dislike	Indifferent
13	Govt., Psychol.,	Phys.Sc., Phil., Ed.	Economics
14	Phys.Sc., Econ. Psychology	Education, Psychol.,	Government, Phil..
15	Psychology	Phys.Sc., Education	Govt., Phil., Econ..
16	Psychology		Phys.Sc., Econ., Ed., Govt., Philosophy
17		Phys.Sc., Education Econ., Phil., Govt.	Psychology
19		Econ., Ed., Phil., Government	Phys.Sc., Psychology
22	Psychology Ed., Govt.,	Phys.Sc., Govt.,	Economics
23	Psychology Govt.,	Econ., Education	Phys.Sc., Philosophy
24	Phys.Sc., Govt. Psychology	Econ., Education	Philosophy
25	Phys. Science Psychology	Govt., Education	Econ., Philosophy
29	Phys.Sc., Phil. Psychology	Govt., Education	Economics
32	Phys.Sciences Psychology		Econ., Govt., Phil., Education
33	Psychol., Govt.		Phys.Sc., Econ., Ed., Philosophy
<u>Below 2.0 Grade Point Average</u>			
2	Psychology	Physical Sciences	Econ., Ed., Govt., Philosophy
11	Psychology	Econ., Ed., Govt., Philosophy	Physical Sciences
18	Phys.Sc., Govt. Economics	Education	Psychology, Phil..
27	Psychology Philosophy	Education	Physical Sciences Econ., Government

APPENDIX D (continued)

Stud. No.	Like	Dislike	Indifferent
28	Psychology	Econ., Government	Phys.Sc., Phil., Education
31	Psychology	Phys.Sc., Govt., Phil., Education	Economics
39	Phys.Sc., Econ. Phil., Psychol. Government		Education
40	Psychology	Econ., Govt., Ed.,	Phys.Sc., Phil
42	Psychology		Phys.Sc., Econ., Phil., Ed., Govt..
46	Phys.Sc., Econ. Psychology	Philosophy	Govt., Education
56	Psychol., Govt.	Philosophy	Phys.Sc., Econ., Education
57	Phys.Sc., Govt. Econ., Psychol.		Education, Phil..
59	Psychology		Phys.Sc., Econ., Ed., Phil., Govt..
60	Psychology	Phys.Sc., Econ., Phil., Education	Government
64	Econ., Govt., Psychology	Phys.Sc., Phil., Education	

APPENDIX E

COMPARISON OF K-I SCORES FOR STUDENTS IN CURRICULA OF
NURSING, ELEMENTARY EDUCATION, AND HOME ECONOMICS

Curricula	1959 All Stdnt.	Nursing			Matched-Matched Fall Spring 1959 1960		El. Ed. Matched-Matched Fall Spring 1959 1960		Home Ec. Matched-Matched Fall Spring 1959 1960	
		Fall 1959	Fall 1960	Hosp. Fall 1960	Fall 1959	Spring 1960	Fall 1959	Spring 1960	Fall 1959	Spring 1960
Gen. Ag.	6.5	4.6	3.2		3.4	2.9	3.3	3.5	3.8	3.7
Agr. Engr.	12.0	7.7	4.6		6.8	4.1	7.6	5.5	5.9	4.4
Art	11.4	13.9	11.9		12.7	10.9	13.6	13.1	12.7	12.5
Architec.	10.9	8.4	7.8		7.6	6.8	9.6	9.4	9.4	8.6
Elem. Ed.	11.6	16.2	14.0		15.8	12.6	16.9	15.7	14.4	12.4
Comm. Sc.	11.3	12.6	10.9		11.9	9.8	13.3	12.5	11.9	11.4
Home Ec.	9.5	12.3	12.8		12.3	12.2	13.6	13.8	14.9	15.4
Phys. Ed.	10.4	12.3	9.5		10.5	9.0	8.7	8.6	9.3	8.0
Sec. Ed.	11.5	12.7	11.0		11.7	10.0	14.3	13.9	12.0	9.7
Chem. Engr.	11.6	9.7	6.9		8.5	5.6	6.8	5.5	7.0	5.6
Civ. Engr.	9.7	5.4	5.2		5.0	4.7	6.5	5.6	6.8	5.9
Elec. Engr.	11.7	9.1	6.3		8.0	5.2	6.4	5.5	6.3	5.0

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LITERATURE CITED

- American Journal of Nursing. 1946. THE KUDER PREFERENCE RECORD IN THE COUNSELING OF NURSES.
American Journal of Nursing, New York. p. 313.
- Cronbach, Lee J. 1949. ESSENTIALS OF PSYCHOLOGICAL TESTING
348 p., Harper and Brothers, New York.
- Darley, John G., and Hagenah, Theda. 1955. VOCATIONAL INTEREST MEASUREMENT THEORY AND PRACTICE.
70 p., The University of Minnesota Press, Minneapolis.
- Ferguson, Leonard W. 1952. PERSONALITY MEASUREMENT
51 p., McGraw-Hill Book Company, New York.
- Hill, George. 1959 EVALUATING THE SCHOOL'S TESTING PROGRAM.
3-7 pp., Center for Educational Research, Athens, Ohio.
- Krakower, Hyman. 1949. TESTS AND MEASUREMENTS APPLIED TO NURSING EDUCATION.
42 p., G.P. Pugnani's Sons, New York.
- Risk, Thomas M. 1947. PRINCIPLES AND PRACTICES OF TEACHING IN SECONDARY SCHOOLS.
641 p., American Book Company, New York.
- Spaney, Emma. 1953. PERSONALITY TESTS AND THE SELECTION OF NURSES.
4-26 pp., Nursing Research 1.
- Taylor, Ella A. 1951. A THREE-YEAR STUDY OF WITHDRAWAL OF STUDENTS FROM SCHOOLS OF NURSING.
National League of Nursing Education, New York.
- Thorndike, Robert and Hagen, Elizabeth. 1956. MEASUREMENT AND EVALUATION IN PSYCHOLOGY AND EDUCATION.
380 p., John Wiley and Sons, New York.
- Triggs, Frances O. 1947. THE MEASURED INTERESTS OF NURSES.
Journal of Educational Research XLII: 117-118.
- Tyler, Ralph W. 1950. BASIC PRINCIPLES OF CURRICULUM AND INSTRUCTION.
51 p., University of Chicago Press, Chicago.