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ABSTRACT

AN ANALYSIS OF [illegible] ACCEPTANCE [illegible] GRADE,
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AND THE [illegible]
[illegible]

AN ANALYSIS OF TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND THE TURSE SHORTHAND APTITUDE TEST IN PREDICTING SHORTHAND SUCCESS

ABSTRACT

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(first year) cl[illegible]es at Lak[illegible]
St. Clair Shores, Michigan, [illegible], the
purpose of this study was [illegible] grade and/or
a combination of variab[illegible] grade,
overall grade-point aver[illegible] grade
Test with four selec[illegible] Gregg
Association, Symbol [illegible] mination)
could be used [illegible]

Dr. Elaine Uthe, Advisor

success (grades of "[illegible]
These groups were [illegible]

Group I had [illegible] each
grade and overall [illegible]
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and failures in Shorthand [illegible] by
set cut-off points for th[illegible]

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ABSTRACT

AN ANALYSIS OF TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND THE TURSE SHORTHAND APTITUDE TEST IN PREDICTING SHORTHAND SUCCESS

Christine T. Fugiel

Because the failure/dropout rate in Shorthand I (first year) classes at Lakeview High School in St. Clair Shores, Michigan, is extremely high, the purpose of this study was to determine whether one and/or a combination of variables (tenth grade English grade, overall grade-point average, Turse Shorthand Aptitude Test with four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination) could be used as a means of predicting Shorthand I success (grades of "C" or higher in Shorthand I). Three groups were used.

Group I had 55 students. The tenth grade English grade and overall grade-point average were used. Correlation coefficients were obtained with the criterion, Shorthand I grade. The correlations were .329 for tenth grade English grade and .642 for overall grade-point average with the criterion. Eliminations of successes and failures in Shorthand I were made using arbitrarily set cut-off points for the two variables. The cut-off

points used, singularly and in combination, were "D" in tenth grade English and 1.75 in overall grade-point average.

Group II had 34 of the 55 Shorthand I students. These students' tenth grade English grade and overall grade-point average were used; they also had taken the Turse Shorthand Aptitude Test. The total score and four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination scores were also used. Coefficients of correlation were obtained with the Shorthand I grade; the highest correlations were that of overall grade-point average with .569 and Phonetic Association with .560. Eliminations of successes and failures in Shorthand I were also made using arbitrarily set cut-off points for tenth grade English grade, overall grade-point average, and Turse total score. The cut-off points were, singularly and in combination, "D" in tenth grade English, 1.75 in overall grade-point average, and 320 in Turse total score.

Group III had 26 students in Shorthand II (second year). Eleven of these students were not in the writer's Shorthand I classes; all of them had taken the Turse Test in 1969. The Turse Test was administered a second time to these Shorthand II students. Their tenth grade English grade, overall grade-point average, and Shorthand I grade, as well as the Turse Test with the same four selected

subtests, were used. Correlation coefficients with Shorthand II showed Shorthand I with .619, Turse total score with .524, overall grade-point average with .488, and Word Discrimination with .405. A multiple correlation was made using the Wherry-Doolittle Test Selection method. The maximum R obtained was .622; the variables used were Shorthand I grade and tenth grade English grade. A multiple regression equation was set up; it accurately predicted only half of the grades in Shorthand II.

Because the sample was small and the variables were not reliable, it was recommended that the study be repeated; that the same variables be used; and that the counselors should use "D" in tenth grade English, 1.75 in overall grade-point average, and 320 for Turse total score in the selection of prospective Shorthand I students.

AN ANALYSIS OF TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND THE TURSE SHORTHAND APTITUDE TEST IN PREDICTING SHORTHAND SUCCESS

An Independent Study
Education 803

by
Christine T. Fugiel

Business and Distributive Education
Michigan State University

July, 1970

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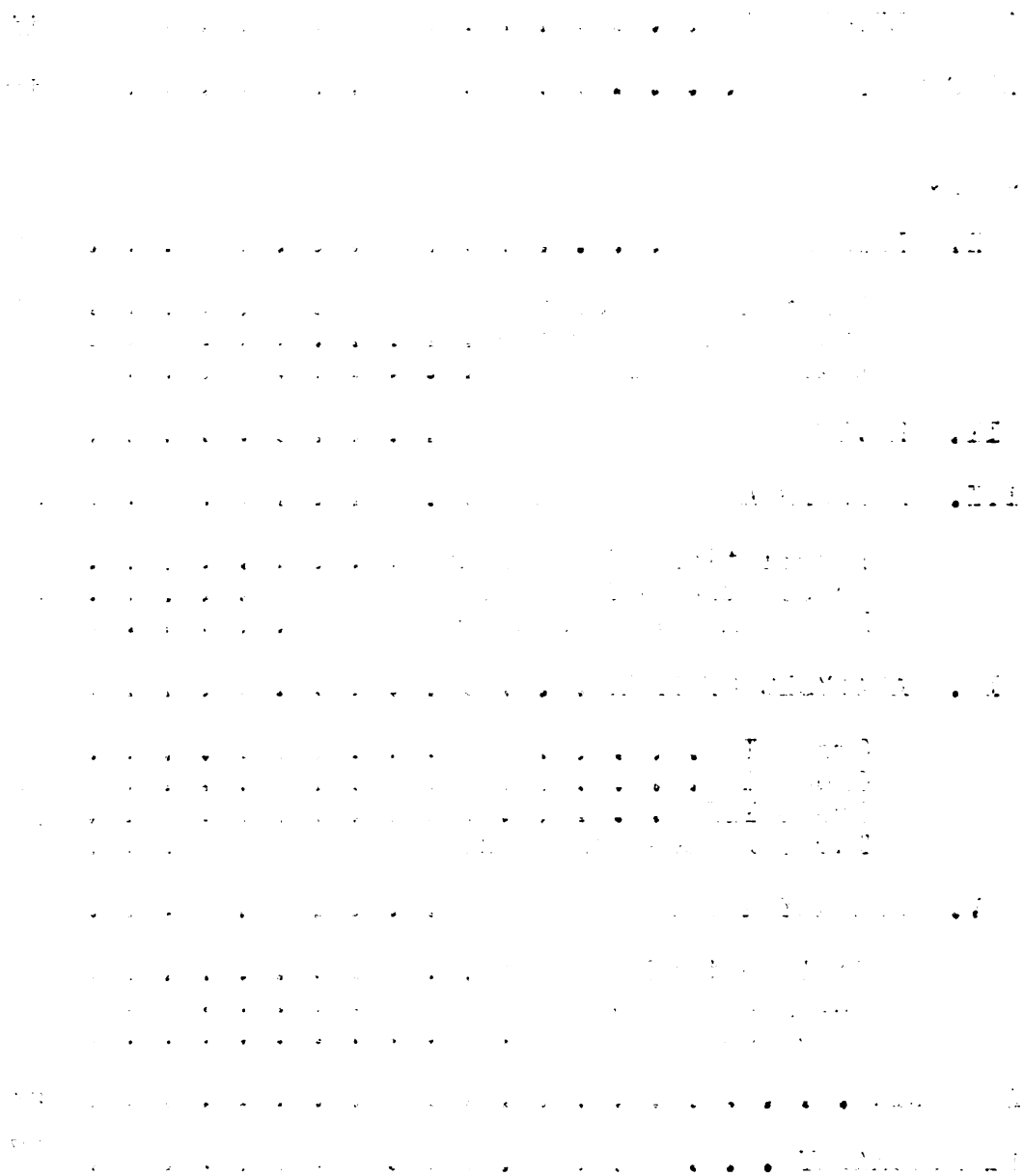

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CHAPTER I

INTRODUCTION

General Statement of the Problem

"Shorthand is one of the subjects in our schools that has a high mortality rate."[1] "More students fail shorthand than any other high school subject."[2] "Shorthand failures and dropouts are among the highest in the curriculum of the nation's high schools."[3] Research indicates that the percentage of students who drop or fail beginning shorthand is extraordinarily high.[4]

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[1]William J. Karaim, "Are We Doing Enough in Shorthand?" The Balance Sheet, L, No. 3 (November, 1968), 117.

[2]Ruth I. Anderson, "Application of Research Findings in Business Education," National Business Education Quarterly, XXXV, No. 2 (Winter, 1966), 92.

[3]Lucille J. DiBona, "Predicting Success in Shorthand," The Journal of Business Education, XXXV (February, 1960), 213.

[4]Inez Frink, "A Comprehensive Analysis and Synthesis of Research and Thought Pertaining to Shorthand and Transcription, 1946-1957," (Doctoral dissertation, Indiana University, 1961), cited by L. Michael Moskovis, "Shorthand Prognosis: Some Conclusions and Recommendations," The Balance Sheet, L, No. 6 (February, 1969), 252.

The question is "What can be done to reduce the number of dropouts in beginning shorthand?"[5]

In 1969 at Lakeview High School in St. Clair Shores, Michigan, the dropout/failure rate at the end of the first semester of six beginning shorthand classes was 35 per cent. This dropout/failure rate is a great concern to teachers, to administrators, to counselors, to students, and to parents.

The question arises as to who or what is responsible for this problem?[6] The answer to this question varies. Leslie, in Methods of Teaching Gregg Shorthand, states:

> No willing, co-operative high school pupil, properly taught, can possibly fail to learn shorthand. If a high school pupil fails to learn shorthand, it is definitely because he is not willing to learn shorthand, because he is not co-operating by doing the homework assignments, or because he is not properly taught.[7]

Ryals states that the answer is obvious--the teacher and the teacher-training institutions are the reasons for the high dropout rate in shorthand.[8] Moskovis states that students should be guided into classes on the basis

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[5]William R. Allen, "Grouping in Beginning Shorthand," The Balance Sheet, XLIV, No. 3 (November, 1969), 123.

[6]Timothy U. Ryals, "A Second Look at the Teaching of First-Year Shorthand," The Balance Sheet, LI, No. 6 (February, 1970), 256.

[7]Louis A. Leslie, Methods of Teaching Gregg Shorthand (New York: McGraw-Hill Book Company, Inc., 1969), p. 268.

[8]Ryals, loc. cit.

of the evidence that is or could be available. He adds that the "problem of high failures and inadequate preparation compounded with perhaps an even greater educational failure--student frustration and vocational disappointment and delay--add impetus to the need for business educators to reexamine their shorthand selection and guidance procedure."[9]

While attempts to develop shorthand prognostic tests have met with only limited success, several research studies have been conducted recently which definitely indicate that the excessive failure rate in shorthand could be reduced through more careful selection of beginning shorthand students. In most surveys, however, teachers report that no special counseling or selection procedures are used to determine those students who should enroll in shorthand.[10] At Lakeview High School, students who have a "C" average in tenth grade English and a "C" average in beginning typing are those who may take shorthand. It is possible for students who do not meet these requirements to enroll in beginning shorthand if they desire; they enroll with the understanding that the course may be difficult for them. The question of who should and who should not enroll in shorthand has

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[9]Moskovis, loc. cit.

[10]Anderson, loc. cit.

concerned business educators for many years. As yet, no single prognostic instrument that offers a definite prediction for success in shorthand has been developed.[11] Nevertheless, business educators should continue to attempt to seek the solution.

Statement of Purpose

The major purpose of this study is to determine whether one and/or a combination of prognostic measures can be utilized at Lakeview High School in order to decrease the dropout/failure rate in beginning shorthand. The purpose of this study can be divided into three categories:

1. To determine the degree of relationship of tenth grade English grades, overall grade-point average, the Turse Shorthand Aptitude Test with a battery of four of the seven subtests, singularly and in combination, to success in beginning shorthand;

2. To determine the degree of relationship of tenth grade English grades, overall grade-point average, the Turse Test with a battery of four subtests, and the final grade in beginning shorthand, singularly and in combination, to success in advanced shorthand;

3. To determine the degree of relationship of the Turse Shorthand Aptitude Test when given as a pretest and as a post test.

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[11] DiBona, loc. cit., p. 214.

Definition of Terms

Shorthand I is the first-year or beginning class while Shorthand II is the advanced or second-year class.

Students who are considered successful in shorthand are those receiving final grades of "C" or higher in Shorthand I at the end of the second semester; students who receive grades of "D" or "F" or who drop out of shorthand class before the end of any term are those who are considered unsuccessful and are included in the failure rate. Those students who receive a "D" in Shorthand I are not permitted to enroll in Shorthand II.

The students' English grades are the final marks for the tenth grade class. Overall grade-point average refers to the cumulative grade point at the end of the sophomore year.

The Turse Shorthand Aptitude Test used in this study will be termed Turse Test; the total test score and the four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination are used in raw score form.

Table 1 gives Guilford's interpretation of the relationship of reliability coefficients and will prove useful in interpreting the coefficients to be obtained in this study.[12]

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[12] J. P. Guilford, Fundamental Statistics in Psychology and Education (2d ed.; New York: McGraw-Hill Book Company, Inc., 1956), p. 135.

TABLE 1. INTERPRETATION OF COEFFICIENTS OF CORRELATION

Reliability	Definition
.90 - 1.00	High correlation, very dependable relationship
.70 - .90	High correlation, marked relationship
.40 - .70	Moderate correlation, substantial relationship
.20 - .40	Low correlation
.00 - .20	Definite, but small relationship

CHAPTER II

REVIEW OF THE LITERATURE

Studies involving variables such as English grades, I.Q., typing grades, and overall grade-point averages have been made in order to establish any predictive value between or among these variables to success in shorthand.

Because the failure rate in shorthand is so high, studies have also been conducted in which aptitude tests are used as possible predictive devices. However, the reliability and validity of aptitude tests are often questioned. In order to determine whether or not any aptitude test should be used in screening prospective shorthand students, one must understand what an aptitude test purports to do. Its primary purpose is to eliminate the unfit or to indicate unusual potentiality; it is not used to predict with a high degree of accuracy the relative standing of individuals for a particular task or skill.[13] Therefore, its function is to indicate achievement potential in a specific area. However, many

[13] Paul L. Turse, "Prognostic Studies in Business Education," National Business Education Quarterly, XXXV, No. 2 (Winter, 1966), 55.

times supplementary factors mitigate the fulfillment of this objective.[14] Results of aptitude tests do not measure the student's true potential for achievement. Why? If a student cannot read and understand instructions, he cannot comply with the demands of a test. If a student reads too slowly, he will not complete the test in the allotted time. If the student cannot understand the vocabulary employed, he cannot understand the individual items.[15] Therefore, it is necessary to consider a number of variables involved in aptitude testing. Some of these variables are: reading scores; I.Q. scores; motor skills such as finger dexterity, hand dexterity, tapping speed, motility, muscular coordination; vocabulary; spelling; visual acuity; serial reaction; proofreading; cancellation; digit and reader comparison; and memory skills.[16] Because of these variables, the reliability and validity of any aptitude test can be questioned. However, Turse points out:

> Considerable reliability for validity of criterion measures in prognostic experiments have not been sufficiently emphasized in the general current literature. One factor which does seem to secure widespread publicity is the apparently low validity coefficient obtained, with the resulting unwarranted tendency, in many cases, on the part

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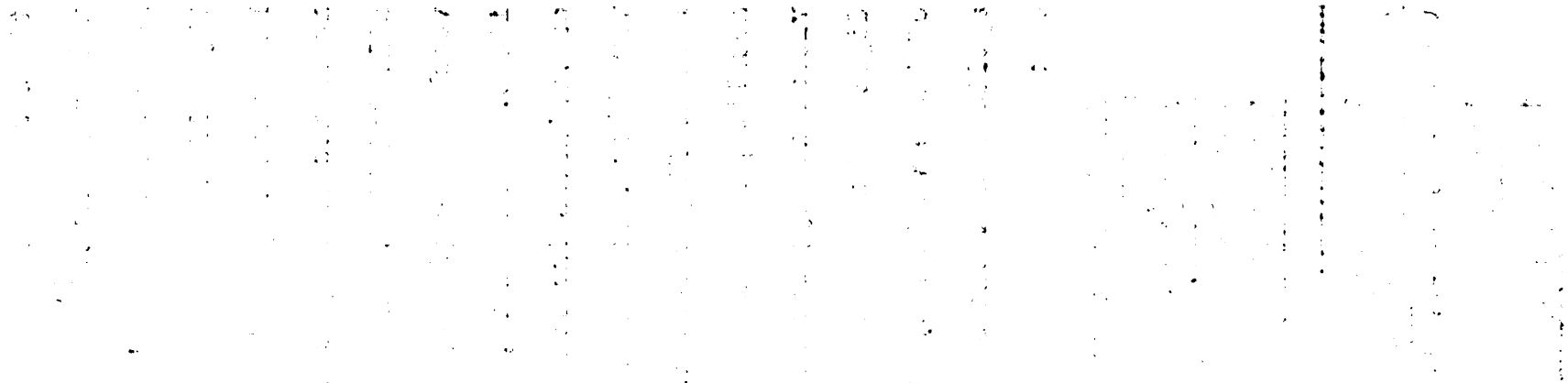
[14] Shirley Ullman Wedeen, "Uses and Misuses of Aptitude Tests," The Clearing House, XXXV, No. 1 (September, 1960), 11.

[15] Ibid.

[16] Turse, loc. cit., p. 56.



> of lay readers, to dismiss the proposed aptitude measures as invalid. The reason for the low coefficients of validity of aptitude tests is not because the test is unreliable nor the criterion used as a measure of success against which the test is validated. The trouble is more often to be found in the narrowness, inadequacy or impurity of this criterion. Good criteria of vocational success are extremely difficult to define and measure. This phase of the problem of test validation has not yet received the searching scrutiny that its importance demands. Until vocational psychologists have developed adequate ways of measuring levels of achievement and satisfactory adjustment in the various vocations, coefficients of validity of the best aptitude tests will continue to be smaller than their true merit warrants.[17]

Because incentive, industriousness, personality, ability, and other chance factors may condition success, many of today's aptitude tests are fallible; and the problem of prediction is still a baffling one.[18]

> In the area of business education, however, considerable experimental evidence is available to show reasonable validity of clerical facility tests for routine types of office duties. There is also evidence to indicate that a carefully constructed aptitude battery in a specific subject-need area can provide a better predictive device than a single 'primary' ability measure.[19]

Moskovis mentions that much prognostic and prognostic-related research has been completed during the past fifty years and that business educators have used only a minor

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[17] Ibid., p. 54-55.

[18] Ibid., p. 53.

[19] Ibid., p. 60.

portion of the information from those studies.[20] Leslie in 1947 warned that many attempts have been made to develop a prognostic test for shorthand, yet none of them have met with success.[21] In spite of this, researchers continue to search for the key to predict shorthand success. Judging from the comments made in business education research studies, many business educators seem to agree that aptitude testing for shorthand holds the answer for lessening the number of shorthand failures. However, no one has found "the" aptitude test; consequently, many studies continue to search in the hopes of discovering that measure.

A study closely related to this one was recently made by Helen Cwiorz Barbor of the Indiana University of Pennsylvania. Barbor attempted to determine the degree of relationship of the Three Shorthand Aptitude Test, I.E., and English grades singularly and in combination to success in first-year shorthand at Jefferson-Morgan Junior-Senior High School, in Jefferson, Greene County, Pennsylvania. Her study involved a combination of variables and included an aptitude test. Ninth and tenth grade English marks were averaged and used as one independent variable.

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[20] Moskovis, loc. cit., p. 253.

[21] Louis A. Leslie, "A Suggested Prognostic Test for Shorthand," American Business Education, IV (December, 1947), 91, cited by Moskovis, loc. cit.

The I.Q. scores were determined using the Stanford-Binet Test. The remaining eight variables were obtained from the individual Turse tests. From a group of 80 students (60 females and 20 males), 46 students were not considered successful in beginning shorthand; these students received less than a "C" in classwork. In other words, 57.5 per cent failed the beginning course. Barbor's study provided the following correlation coefficients:

Turse Test I.Q.	=	.4203
I.Q. English Grades	=	.4437
Turse Test English Grades	=	.4771
Turse Test I.Q. English Grades	=	.4775

Because I.Q. did not substantially change the correlation, Barbor stated that I.Q. should rank last in considering the variables to be used in predicting shorthand success. Thus, the Turse Test and English grades were to be used as the main criteria on which to base a student's admission to a shorthand class at Jefferson-Morgan Junior-Senior High School. Barbor also found that certain subtests of the Turse Test, such as the Phonetic Association, Word Sense, Word Discrimination, and Symbol Transcription, had the highest predictive value; she

stated that these subtests should be examined in screening future shorthand students.[22]

In 1932, Harnack dealt with a self-prepared aptitude test for shorthand. Harnack cited previous studies conducted by Worley, Hoke, and Ohmann. Worley stated that predicting success in shorthand through the marks made in other subjects indicated a need for a functioning type of prognostic test.[23] Hoke's results from prognostic testing were indefinite and inaccurate.[24] Ohmann concluded that, although he had not found a satisfactory prognostic test, there was every indication that one would be constructed.[25] Harnack developed her own aptitude test which was given to 206 pupils in shorthand in the Detroit High School of Commerce during the opening semester of

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[22]Letter from Helen Cwierz Barbor, May 12, 1970, containing excerpts from her Master's thesis, "The Relationship of the Turse Shorthand Aptitude Test, I.Q., and English Grades to Success in Beginning Shorthand," Indiana University of Pennsylvania, 1968.

[23]Raymond J. Worley, "Prognosis in Shorthand," The Journal of Business Education, VI (September, 1931), 13, cited by Elizabeth C. Harnack, "A Study in Prognostic Testing in Shorthand," (unpublished Master's thesis, Wayne State University, 1932), p. 4.

[24]"Results of a Study of the Validity of the Hoke Prognostic Tests of Stenographic Ability," The American Shorthand Teacher, X (January, 1930), 182, cited by Harnack, loc. cit.

[25]O. A. Ohmann, The Possibility of Prognosis in Stenography, (Research Studies in Commercial Education, First Series, No. 7) (Iowa City: University of Iowa Press, 1926), 36, cited by Harnack, loc. cit.

school in 1931. The test was composed of sections on spelling, English usage, transcription, and shorthand spelling; it was timed, and directions were given both orally and in written form. As a result of this testing, Harnack concluded that the correlations, while they were low, denoted that there was some relationship between the tests and the ultimate achievement in shorthand. Coefficients of correlation were shorthand achievement to spelling .296; to English usage, .475; to transcription, .221; and to shorthand spelling, .244.[26] Harnack noted that the activities in the self-prepared aptitude test did function in the study of shorthand. She suggested that the test be repeated and a more reliable criterion be used. The criterion used in Harnack's study was the teacher's mark at the end of the course. Harnack concluded that the test should be revised, and those sections correlating highest with achievement scores should be made more prominent; that the number of pupils in the sample should be larger; and that in order to predict success in shorthand, it might prove advantageous to use pupils in the advanced courses and determine what actually makes for success in shorthand and then devise a test that would adequately measure those activities.[27]

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[26] Harnack, loc. cit., p. 12.

[27] Ibid., p. 16.

More recent studies still indicate that better prognostic measures are needed to determine success in shorthand. In 1958, Byers constructed a predictive test for first-year shorthand.[28] Hall preferred to use the ITED Test as an indicator of shorthand success at Sky View High School in Utah. Results of her 1966 study indicated that use of this test would be justified at her school as a predictor of success in beginning shorthand.[29]

The Strickland study of 1957 attempted to determine what criteria could best be used to predict probable success in shorthand at East High School in Columbus, Ohio. Her recommendations for the variables to be used in counseling students into shorthand included general scholastic averages, English grades, Turse Shorthand Aptitude scores, Differential Aptitude Test (Sentences and Spelling tests).[30]

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[28] Edward E. Byers, "Construction of Tests Predictive of Success in First-Year Shorthand" (unpublished Ed.D. dissertation, Boston University, 1958), quoting National Business Education Quarterly, XXVIII, No. 1 (Fall, 1959).

[29] Wilma J. Hall, "The ITED Test as Indicator of Shorthand I Success at Sky View High School" (unpublished Master's thesis, Utah State University, 1966), quoting National Business Education Quarterly, XXXVI, No. 1 (Fall, 1967).

[30] Ester Hedges Strickland, "Criteria for Predicting Success in Shorthand at East High School, Columbus, Ohio" (unpublished Master's thesis, The Ohio State University, 1957), quoting National Business Education Quarterly, XXVII, No. 1 (Fall, 1958).

The purpose of the Missling study was threefold.

1. Determine whether or not prognostic tests were effective methods to use in predicting success in shorthand;

2. Find out what factors--typing grades, English grades, high school grades excluding English, and aptitude tests--had the greatest bearing on shorthand;

3. Advise those students whose chances of success in shorthand were limited to enroll in other courses.

Her study showed a correlation of .616 for the total scores on the Turse Test to success in shorthand. The highest correlation with shorthand success was obtained for scholastic averages, .660. She recommended that more factors than the Turse Test be used for prognosis.[31]

DiBona made a study in Chicago schools from September, 1954, to June, 1956, in which the following instruments were used to predict success in shorthand: Turse Shorthand Aptitude Test, E.R.C. Stenographic Aptitude Test, Otis Quick-Scoring Intelligence Test; English average-grade scores for ninth and tenth grades; and scholastic averages in major subjects in grades nine and ten. She concluded that the best instrument for predicting success should be selected on the highest correlation between any test and the achievement at the

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[31] Lorraine Missling, "Prognostic Testing in Shorthand" (unpublished Master's thesis, University of Wisconsin, 1954), quoting National Business Education Quarterly, XXIV, No. 1 (Fall, 1955).

predicting whether or not a high school student would be successful in completing a sequence of shorthand courses. The results indicated that the DAT scores should not be used for predicting success in shorthand work. However, the "Language Usage" test was not used; and further research using all seven tests of the Differential Aptitude Test might prove fruitful.[35]

In a 1960-1961 study made by Cheney and Goodish at Reno High School in Reno, Nevada, 30 per cent of the students enrolled in the beginning shorthand class were unsuccessful. The students had taken the DAT; the scores on this test as well as English grades and general scholastic averages were correlated to determine which variables were the best predictor of shorthand success. The following correlations were found:

English grades and Shorthand Achievement	= .695
Scholastic Averages and Shorthand	= .654
Spelling (DAT) and Shorthand	= .525
Sentences (DAT) and Shorthand	= .461
Verbal Reasoning (DAT) and Shorthand	= .381[36]

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[35] Rosanne C. Hendrickson, "The Differential Aptitude Tests for Verbal Reasoning, Numerical Ability, Abstract Reasoning, Spatial Relationships, Mechanical Reasoning, and Clerical Speed and Accuracy as Predictors of Success in Shorthand" (unpublished Master's thesis, University of Minnesota, 1963), quoting National Business Education Quarterly, XXXIII, No. 1 (Fall, 1964).

[36] Truman M. Cheney and Naomi Goodish, "Analysis--Between Certain Variables and Achievement in Beginning Shorthand," The Journal of Business Education, XXXVIII, No. 8 (May, 1963), 318.

end of the beginning shorthand class. The Turse Test was chosen as first choice with the E.R.C. Stenographic Aptitude Test as second choice. The Turse Test would be supplemented with a study of personal traits and/or with English grades or English placement tests; and/or with I.Q.; and/or with scholastic averages.[32] Implications from her study for counseling prospective shorthand students were as follows:

> Inasmuch as counselors and students do use grades as criteria for achievement, either one /personal traits, English grades or English placement tests, or scholastic averages/ of these instruments could be used as a third choice, or to supplement the I.Q. or aptitude test, as a basis for counseling students wishing to take shorthand.[33]

If aptitude tests were not available, DiBona suggested that use of the cumulative folder, utilizing the I.Q. indication, the English and scholastic background, and personality traits, be used in selection procedures.[34]

Hendrickson used the Differential Aptitude Test (DAT) in her study in Minnesota. The purpose was to determine whether the DAT was a valid means of

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[32] DiBona points out that English grades indicate both a mastery of English fundamentals and of literature and may not be as effective in predicting shorthand success as a placement test in English fundamentals. (DiBona, loc. cit.)

[33] Ibid.

[34] Ibid.

English grades increased the accuracy of prediction, and it was almost as effective as the use of the five other variables combined. Cheney and Goodish stated that students whose scores were high in the five variables and who were well motivated were the ones who were most successful in beginning shorthand. They therefore recommended that a number of variables be used in predicting shorthand success, that limits of "C-" be used in English and scholastic averages, and that a limit of 35 on the DAT Spelling Test be used. Cheney and Goodish found that no successes were eliminated--only failures were eliminated in this particular study--when the above recommendations were used.[37]

Lang found that performance on the Language Construction subtest of the Language Aptitude Examination correlated highly with shorthand achievement.[38] This is an area open for further study.

The problem of a high failure rate in shorthand will continue to be one of concern to business educators. The past research studies indicated the need for an effective prognostic measure or measures which could be

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[37] Ibid., p. 319.

[38] Mary Jane Lang, "Predicting Achievement in Elementary Stenography," School and Community, LIV, No. 3 (November, 1967), 20.

used to proficiently prognosticate those students who could achieve success in shorthand. Until a solution is discovered, this problem will remain unsolved.

CHAPTER III

METHODS AND PROCEDURES

Description of Subjects

The subjects of this study were female students between the ages of 16 and 18 in Shorthand I and II at Lakeview High School in St. Clair Shores, Michigan. The Lakeview School District, a suburb of Detroit, is located in Macomb County. It is essentially populated by upper middle-class families. Lakeview High School is a comprehensive high school with a total enrollment of 2,012 for the 1969-1970 year; the faculty included 83 teachers, 2 librarians, 7 counselors, 3 administrators, and 8 secretaries.

The students were divided into three groups:

GROUP I included all 55 students from two of six Shorthand I sections during the 1968-1969 school year. The two sections were selected because they were taught by the writer. They did not take the Turse Test.

GROUP II included 34 of these same 55 students who remained in Shorthand I at the beginning of the second semester; these students had taken the Turse Test in May, 1969.

GROUP III included 26 students enrolled in Shorthand II during the 1969-1970 school year; these students had taken the Turse Test in May, 1969, and again in March, 1970. Eleven of the 26 were not in the writer's Shorthand I classes but were included because they had taken the Turse in 1969. They were considered successful in Shorthand I.

Description of Measures Employed

Because this study involved the determination of some predictive measure of success in shorthand, the variables which were used were as follows:

GROUP I - Tenth grade English grade
Tenth grade overall grade-point average

GROUP II - Tenth grade English grade
Tenth grade overall grade-point average
Turse Shorthand Aptitude Test with subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination

GROUP III - Tenth grade English grade
Tenth grade overall grade-point average
Turse Shorthand Aptitude Test with subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination
Shorthand I final grade

The tenth grade English grade was obtained from the student's cumulative or permanent file which was located in the high school's main office. These grades were recorded as letter marks and then scaled in terms of the normal curve by using the standard deviation distances

from the mean of various per cents of a normal distribution.[39] The reliability and validity of the English grades are questionable as the tenth grade English course dealt with both grammar and literature; the degree to which the final grade in English measured the grammar and punctuation abilities or construction ability of students is not known because of the subjectivity in marking that was used by six tenth grade English teachers.[40]

Each student's overall grade-point average at the end of the sophomore year was obtained from the high school records secretary.[41] The grade-point average was computed on all full-credit subjects with the exception of health, band, physical education, vocal music, driver education, and cooperative work experience. Honor points

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[39] Henry E. Garrett and R. S. Woodworth, Statistics in Psychology and Education (5th ed.; New York: Longmans, Green and Co., 1958), p. 457.

[40] English grades and English tests generally show low relationships with shorthand achievement. (B. T. Hutson and N. M. Vincent, "Motivation and Prognosis in Shorthand," The Journal of Business Education, XXXIII, (October, 1957), 29-31, cited by Elise D. Palmer and Sally Bulkley Pancrazio, "Shorthand Selection Procedures: Are They Justifiable?" Business Education Forum, XXII (October, 1967), 14.

[41] Cumulative grade-point average shows a substantial relationship to shorthand as well as to other subjects. (Ibid.).

were calculated on the following basis:

Regular Courses	Honor Courses
A = 4 points	A = 5 points
B = 3 points	B = 4 points
C = 2 points	C = 3 points
D = 1 point	D = 2 points
E = 0 points	E = 0 points

The Turse Shorthand Aptitude Test was given to Group II in May, 1969, and to Group III in March, 1970. All of the students in Group III had previously taken the Turse Test in 1969 as well. The Turse Test purportedly measures the following: manual dexterity; ability to write, carry matter in the mind, and listen for new matter simultaneously; ability to learn and combine abstract symbols; ability to associate the correct literal spelling of a word with its phonetic form; ability to discriminate between words having similar or identical shorthand outlines; spelling ability; and ability to construct entire words from the incomplete shorthand outlines.[42] The Turse Test is intended to eliminate only those who are unfit and is not meant to predict accurately the relative standing of those who continue shorthand.[43] Because the objectives of the Turse Test are based on shorthand-type content,

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[42]Paul L. Turse, "Manual of Directions," Turse Shorthand Aptitude Test (New York: Harcourt, Brace & World, Inc., 1940), p. 1.

[43]Ibid., p. 4.

the Turse does measure what it purports to measure (although studies other than those done by Turse do not necessarily obtain the same conclusion). The correlation of the Turse with the Durost-Turse Correction-Transcription Test of Stenographic Achievement was as follows:

Stroking and Achievement Test	= .30
Spelling and Achievement Test	= .34
Phonetic Association and Achievement Test	= .57
Symbol Transcription and Achievement Test	= .38
Word Discrimination and Achievement Test	= .50
Dictation and Achievement Test	= .33
Word Sense and Achievement Test	= .57
Total Aptitude and Achievement Test	= .67[44]

From Table 1, Phonetic Association, Word Discrimination, Word Sense, and Total Aptitude are the only correlations which show a substantial relationship to the achievement test. The raw scores from the Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination subtests as well as the Total Turse scores were used in this study.

Research Design and Procedures

The purpose of this study was to discover if there is any relationship existing between or among certain

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[44] Ibid., p. 3.

variables and Shorthand I through the use of correlation coefficients. This design was chosen because of the efficiency with which a number of variables and their interrelationships can be measured simultaneously. It was also useful in that it permitted carrying out a prediction study and making an estimate of its probable accuracy.[45]

One of the procedures used in this design was the Pearson product-moment correlation coefficient. The Pearson product-moment correlation, designated by r, is a statistical measure of the degree of association between two variables. The correlation coefficient has two attributes: magnitude (size) and direction. The raw score formula for calculating correlation coefficients given below was employed:[46]

$$r_{XY} = \frac{N\Sigma XY - \Sigma X \Sigma Y}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}\ \sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$$

The Pearson product-moment formula was used for all calculations.

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[45] Walter R. Borg, Educational Research: An Introduction (1st ed.; New York: David McKay Company, Inc., 1963), p. 270.

[46] Lassar G. Gotkin and Leo S. Goldstein, Descriptive Statistics: A Programed Textbook, Vol. 2 (New York: John Wiley & Sons, Inc., 1965), p. 104.

Letter grades were scaled in terms of the normal curve by using the standard deviation distances from the mean of various per cents of a normal distribution.[47] Weights or numerical values were assigned to these letter grades; these weights were then expressed as a standard deviation distance from -3.00 σ (this step avoids negative values). By dropping decimals, the first two digits were the weights obtained for letter grades of A, B, C, D, and E.[48]

The Wherry-Doolittle Test Selection Method was used in the solution of the multiple correlation for Group III for the following variables: tenth grade English grade; overall grade-point average; Turse total score; Spelling, Phonetic Association, Symbol Transcription, Word Discrimination (subtests of the Turse); and Shorthand I grade. By using the Wherry-Doolittle method, those tests which yielded a maximum R with the criterion of Shorthand II final grade (first semester) were used while the rest were discarded; the calculation of the multiple R after the addition of each test was stopped when R no longer increased; and the computation of a multiple regression equation from which the prediction of shorthand success with the highest precision was made possible.[49]

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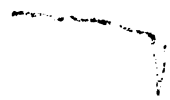
[47] Garrett and Woodworth, loc. cit.

[48] Ibid., p. 324-26.

[49] Ibid., p. 426.

The coefficient of forecasting efficiency or of dependability was also used. This coefficient was used as a quick estimate of the predictive efficiency of an obtained r. It is derived from k, the coefficient of alienation for determining the predictive value of r. The formula is:[50] $E = 1 - \sqrt{1 - r^2}$

[50] Ibid., p. 177-78.



CHAPTER IV

ANALYSIS OF DATA

GROUP I

Fifty-five students were enrolled in Shorthand I in September, 1963. Because these students did not take the Turse Test at that time, their final grade in tenth grade English and their overall grade-point average at the end of their sophomore year were used in determining the degree of relationship with success in Shorthand I.

This purpose posed the following questions:

1. What are the coefficients of correlation between the tenth grade English grade and the overall grade-point average to success in Shorthand I?

2. Using the tenth grade English grade and the overall grade-point average, singularly or in combination, which would be most predictive of success in Shorthand I?

Correlation Between Tenth Grade English Grade, Overall Grade-Point Average, and Shorthand I. Table 2 shows the correlation coefficients between tenth grade English grade and overall grade-point average to success in Shorthand I. It is interesting to note that the correlation between Shorthand I grade and overall grade-point average falls into a moderate or substantial relationship with an r of .642. This substantiates the

statement made by Palmer and Panoramic that grade-point average shows moderate correlation to Shorthand I grades; it must be remembered that the degree of correlation of grade-point average to other subjects is true as well.

TABLE 2. COEFFICIENTS OF CORRELATION FOR TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND SHORTHAND I GRADE FOR FIFTY-FIVE SHORTHAND I STUDENTS AT LAKEVIEW HIGH SCHOOL

(1) Shorthand I Grade
(2) Tenth Grade English Grade
(3) Overall Grade-Point Average

	(1)	(2)	(3)
(1)	-	-	-
(2)	.329	-	-
(3)	.642	.629	-

Failure Rate and Cut-off Score. From the group of 55 students, 21 were considered unsuccessful in the first semester of Shorthand I. In other words, 38 per cent of the students had either dropped out or received a "D" or "E" grade (students who dropped out after the first two weeks in a course drop with an "E" according to school policy). In order to predict those students who will not be successful in Shorthand I, cut-off points for tenth grade English grade and overall grade-point average were arbitrarily set so that analysis of failures and successes could be accomplished.

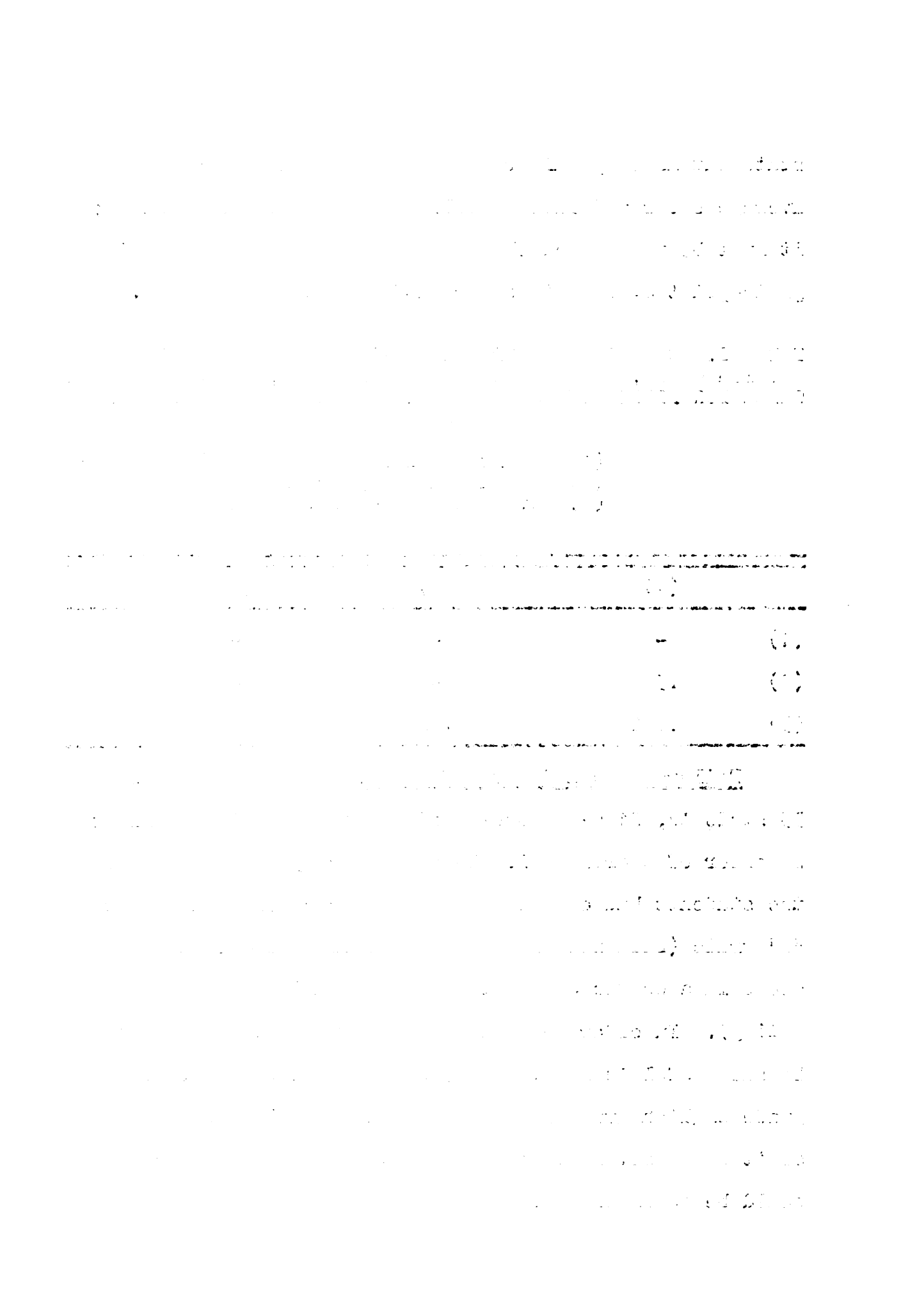


Table 3 shows the eliminations of successes and failures using cut-off points of "D" and "C" for tenth grade English grade for Group I. When the tenth grade English grade was used as the only predictor, the students who received a "D" in English represented 7 of the 22 Shorthand I failures (31.8 per cent) while 6 of the 33 Shorthand I successes (18.2 per cent) were eliminated. Therefore, the tenth grade English grade cannot be considered an adequate predictor of success in Shorthand I.

TABLE 3. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON TENTH GRADE ENGLISH GRADE FOR GROUP I

Cut-off	Number of Successes	% N=33	Number of Failures	% N=22
D	6	18.2	7	31.8
C	16	48.5	15	68.2

Table 4 shows the eliminations of successes and failures using cut-off points for overall grade-point average for Group I. When using overall grade-point average as the only predictor of Shorthand I success, it was found that with a 1.75 cut-off level, 10 out of the 22 failures, or 45.5 per cent, fell in this category while 9 of the 33 successes, or 27.5 per cent, fell in this bracket. The cut-off of 1.75 should be used in

selecting Shorthand I students if no other variables are used because 45.5 per cent of the failures were eliminated while only 27.3 per cent of the successes were eliminated. This cut-off eliminated the least amount of successes.

TABLE 4. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON OVERALL GRADE-POINT AVERAGE FOR GROUP I

Cut-off	Number of Successes	% N=33	Number of Failures	% N=22
1.75	9	27.3	10	45.5
2.00	11	33.3	16	72.7
2.25	16	48.5	18	81.8

In Table 5 the cut-off points for tenth grade English grade and overall grade-point average were combined. The predictive combination resulting in the most elimination of failures and the least elimination of successes was found to be a "D" in English and a 2.00 grade-point average. In this category, 7 of the 22 failures (31.8 per cent) were eliminated while only 4 of the 33 successes (12.1 per cent) were eliminated.

TABLE 5. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON TENTH GRADE ENGLISH GRADE AND OVERALL GRADE-POINT AVERAGE FOR GROUP I

Cut-off	Number of Successes	% N=33	Number of Failures	% N=22
D and 1.75	4	12.1	4	18.2
C and 1.75	8	24.2	9	40.9
D and 2.00	4	12.1	7	31.8
C and 2.00	8	24.2	13	59.1
D and 2.25	5	15.2	7	31.8
C and 2.25	12	36.4	13	59.1

GROUP II

Thirty-four of the original 55 students in Shorthand I were enrolled at the start of the second semester. These students were given the Turse Test in May, 1969. The purpose in using this group was to determine the degree of relationship of a student's scores on a battery of four of the seven subtests in the Turse Test, the tenth grade English grade, and the overall grade-point average, singularly and in combination, to the student's success in Shorthand I.

In order to achieve this purpose, the following questions must be answered:

1. What are the coefficients of correlation between the tenth grade English grade, the overall grade-point average, and the Turse

CHAPTER II

Thirty-four of the original 55 students in Shorthand I were enrolled at the start of the second semester. These students were given the Turse Test in May, 1959. The purpose in using this group was to determine the degree of relationship of a student's scores on a battery of four of the seven subtests in the Turse Test, the tenth grade English grade, and the overall grade-point average, singularly and in combination, to the student's success in Shorthand I.

In order to achieve this purpose, the following

Test with the four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination to success in Shorthand I?

2. What are the coefficients of correlation between the four selected subtests of the Turse Test and success in Shorthand I?

3. Using the tenth grade English grade, overall grade-point average, and the Turse Test with the four selected subtests, which would be most predictive of success in Shorthand I?

Correlation of Shorthand I Success to Selected Factors. The intercorrelation coefficients of the seven variables and Shorthand I can be found in Table 6. The correlation coefficient between Shorthand I and the Turse total score was .265; between Shorthand I and tenth grade English grade, .234; and between Shorthand I and overall grade-point average, .569. The correlations between Shorthand I and Turse as well as Shorthand I and tenth grade English grade are low; there is little relationship here. The correlation between Shorthand I and overall grade-point average is substantial; it is interesting to note that this is the same relationship obtained from Group I. Only one Turse subtest, Phonetic Association, showed a substantial relationship to Shorthand I. It might prove fruitful to use this subtest in selection procedures for enrolling students into Shorthand I.

TABLE 6. INTERCORRELATIONS OF THREE TOTAL SCORES, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND FOUR SELECTED SUBTESTS OF SPELLING, PHONETIC ASSOCIATION, SYMBOL TRANSCRIPTION, AND WORD DISCRIMINATION TO SHORTHAND I GRADE FOR GROUP II

(1) Shorthand I Grade
(2) Turse Total Score
(3) Tenth Grade English Grade
(4) Overall Grade-Point Average
(5) Spelling
(6) Phonetic Association
(7) Symbol Transcription
(8) Word Discrimination

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	-	-	-	-	-	-	-	-
(2)	.265	-	-	-	-	-	-	-
(3)	.234	-.006	-	-	-	-	-	-
(4)	.569	.168	.585	-	-	-	-	-
(5)	.296	.666	-.336	.075	-	-	-	-
(6)	.560	.607	.074	.218	.351	-	-	-
(7)	-.136	.538	-.142	-.008	.302	.201	-	-
(8)	.367	.497	-.126	.325	.268	.408	.050	-

Forecasting efficiency provides a quick estimate of the predictive efficiency of an obtained r; it is called the coefficient of forecasting efficiency or the coefficient of dependability. Table 7 shows the forecasting efficiency for each of the seven variables. Overall grade-point average shows 17.8 per cent efficiency in predicting success in Shorthand I. The subtest of Phonetic Association ranks second with 17.2 per cent.

None of the factors appear to be useful in predicting Shorthand I success.

TABLE 7. FORECASTING EFFICIENCY FOR TURSE TOTAL SCORE, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND FOUR SELECTED SUBTESTS OF SPELLING, PHONETIC ASSOCIATION, SYMBOL TRANSCRIPTION, AND WORD DISCRIMINATION FOR GROUP II

Variable	Percentage
Turse Total Score	3.6
Tenth Grade English Grade	2.8
Overall Grade-Point Average	17.8
Spelling	4.5
Phonetic Association	17.2
Symbol Transcription	1.9
Word Discrimination	7.0

Failure Rate and Cut-off Score. From the group of 34 students who entered the second semester of Shorthand I, five were not successful. In other words, 14.7 per cent failed the course.

Table 8 shows the eliminations of successes and failures using cut-off levels for tenth grade English grade. When using English as the only predictor of Shorthand I success, the cut-off of "D" in English eliminated 2 of the 5 shorthand failures (40.0 per cent) while only eliminating 4 of the 29 shorthand successes (13.8 per cent). This cut-off point again eliminates

the least number of successes. Students should have at least a "D" in tenth grade English in order to succeed in Shorthand I.

TABLE 8. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON TENTH GRADE ENGLISH GRADE FOR GROUP II

Cut-off	Number of Successes	% N=29	Number of Failures	% N=5
D	4	13.8	2	40.0
C	14	48.3	3	60.0

Table 9 shows the eliminations of successes and failures using cut-off levels for overall grade-point average for Group II. When using overall grade-point average as the only predictor of Shorthand I success, it was found that at a cut-off of 1.75, 3 of the 5 shorthand failures, or 60.0 per cent, were eliminated while 6 of the 29 successes, 20.7 per cent, were eliminated. This cut-off level eliminates the least number of successes and also coincides with the results from Group I as to the cut-off point which should be used.

TABLE 9. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON OVERALL GRADE-POINT AVERAGE FOR GROUP II

Cut-off	Number of Successes	% N=29	Number of Failures	% N=5
1.75	6	20.7	3	60.0
2.00	9	31.0	3	60.0
2.25	13	44.8	4	80.0

Table 10 shows the eliminations of successes and failures using cut-off points for the total score on the Turse Test. Because the arbitrary cut-off points which were set provide the same results, the Turse Test used independently is not a reliable indicator of success in Shorthand I in this particular group. There was not a sufficient fluctuation in scores from the group tested.

TABLE 10. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON TURSE TOTAL SCORE FOR GROUP II

Cut-off	Number of Successes	% N=29	Number of Failures	% N=5
320	2	6.9	2	40.0
330	2	6.9	2	40.0
340	2	6.9	2	40.0

Table 11 shows the combination of cut-off levels for tenth grade English grade, overall grade-point average, and Turse total score. When combining their English

grade, overall grade-point average, and Turse total score, the best combination resulting in the elimination of the most failures and the elimination of the least successes in shorthand was "D" in English; 1.75 for overall grade-point average; and 320 for Turse total score. This eliminated 2 of the 5 failures (20.0 per cent) and none of the successes. However, it should be mentioned that the small size of the sample has also affected this distribution in scores.

TABLE 11. ELIMINATIONS OF SUCCESSES AND FAILURES USING CUT-OFF POINTS ON TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND TURSE TOTAL SCORE FOR GROUP II

Cut-off	Number of Successes	% N=29	Number of Failures	% N=5
D and 1.75 and 320	0	0	1	20.0
C and 1.75 and 320	0	0	2	40.0
D and 1.75 and 330	0	0	1	20.0
C and 1.75 and 330	0	0	2	40.0
D and 1.75 and 340	0	0	1	20.0
C and 1.75 and 340	0	0	2	40.0
D and 2.00 and 320	0	0	1	20.0
C and 2.00 and 320	0	0	2	40.0
D and 2.00 and 330	0	0	1	20.0
C and 2.00 and 330	0	0	2	40.0
D and 2.00 and 340	0	0	1	20.0
C and 2.00 and 340	0	0	2	40.0
D and 2.25 and 320	0	0	1	20.0
C and 2.25 and 320	2	6.9	2	40.0

TABLE 11. (continued)

Cut-off	Number of Successes	% N=29	Number of Failures	% N=5
B and 2.25 and 330	0	0	1	20.0
C and 2.25 and 330	2	6.9	2	40.0
D and 2.25 and 340	0	0	1	20.0
C and 2.25 and 340	2	6.9	2	40.0

GROUP III

Twenty-six students who were enrolled in Shorthand II in 1969-1970 were the subjects of this group. These students had taken the Turse Test in May, 1969, and again in March, 1970. Their tenth grade English grade, overall grade-point average, the Turse Test with a battery of four selected subtests, and their final grade in Shorthand I at the end of the second semester were used to determine the degree of relationship with the dependent variable, success in Shorthand II.

This purpose posed the following questions:

1. What are the coefficients of correlation between the tenth grade English grade, overall grade-point average, the Turse Test with four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination, and Shorthand I grade to success in Shorthand II?

2. Using a combination of the tenth grade English grade, overall grade-point average, the Turse Test, the four selected subtests, and Shorthand I grade, which would be most predictive of success in Shorthand II?

3. What is the reliability coefficient of the Turse Test when given in May, 1969, as a pretest, and in March, 1970, as a post test?

Correlation of Shorthand I Success with Selected Factors. Table 12 shows the intercorrelations obtained for Shorthand II with the variables of tenth grade English grade, overall grade-point average, Turse Test and four selected subtests, and the Shorthand I grade.

TABLE 12. INTERCORRELATIONS OF TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, TURSE TOTAL SCORE, AND FOUR SELECTED SUBTESTS OF SPELLING, PHONETIC ASSOCIATION, SYMBOL TRANSCRIPTION, WORD DISCRIMINATION, AND SHORTHAND I GRADE TO SHORTHAND II GRADE FOR GROUP III

(1) Shorthand II Grade
(2) Tenth Grade English Grade
(3) Overall Grade-Point Average
(4) Turse Total Score
(5) Spelling
(6) Phonetic Association
(7) Symbol Transcription
(8) Word Discrimination
(9) Shorthand I Grade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	-	-	-	-	-	-	-	-	-
(2)	.329	-	-	-	-	-	-	-	-
(3)	.488	.620	-	-	-	-	-	-	-
(4)	.524	.172	.159	-	-	-	-	-	-
(5)	.306	.110	-.024	.534	-	-	-	-	-
(6)	.375	.105	.118	.666	.369	-	-	-	-
(7)	.358	.437	.347	.703	.196	.377	-	-	-
(8)	.405	.005	.372	.489	.069	.392	.233	-	-
(9)	.619	.147	.452	.640	.242	.734	.327	.507	-

The highest correlations obtained from this data were as follows:

Shorthand II Grade Shorthand I Grade	=	.619
Shorthand II Grade Turse Total Score	=	.524
Shorthand II Grade Overall Grade-Point Average	=	.488
Shorthand II Grade Word Discrimination	=	.485

These correlations fall within the moderate category; therefore, substantial relationships exist within these areas.

The forecasting efficiency shown in Table 13 points out that Shorthand I grade, Turse total score, and overall grade-point average have the highest predictive value of the variables given. However, none of the factors have a high enough forecasting efficiency to be useful or practical.

TABLE 13. FORECASTING EFFICIENCY FOR TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, TURSE TOTAL SCORE, SPELLING, PHONETIC ASSOCIATION, SYMBOL TRANSCRIPTION, WORD DISCRIMINATION, AND SHORTHAND I GRADE FOR GROUP III

Variable	Percentage
Tenth Grade English Grade	5.6
Overall Grade-Point Average	12.7
Turse Total Score	14.9
Spelling	4.8
Phonetic Association	7.3
Symbol Transcription	6.6
Word Discrimination	8.6
Shorthand I Grade	21.5

Multiple Correlation. The Wherry-Doolittle Test Selection method was used in order to select the best battery of tests from tenth grade English grade, overall grade-point average, Turse Test and the four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination, and Shorthand I grade to predict the criterion, Shorthand II grade. From Table 14, the variables of Shorthand I grade and tenth grade English grade were selected for the test battery. The Turse total score was not selected, because the addition of this variable did not increase the multiple R. The variables of Shorthand I grade and tenth grade English grade constituted a battery which had the highest correlation (.646) of any combination of the eight variables. The multiple R between Shorthand II and all eight variables would be somewhat lower (.644), when corrected for chance errors, than the R for the battery of two variables.

TABLE 14. CORRELATION COEFFICIENTS OF SELECTED VARIABLES WITH SHORTHAND II CRITERION* USING WHERRY-DOOLITTLE TEST SELECTION METHOD

Variable	R
Shorthand I Grade	.619
Shorthand I Grade and Tenth Grade English Grade	.646
Shorthand I Grade, Tenth Grade English Grade, and Turse Total Score	.644

*See Appendix J for computational worksheets.

The corrected multiple correlation between the criterion, Shorthand II, and the selected variables of Shorthand I grade and tenth grade English grade was found to be .622.

It is interesting to note that the zero-order correlation between Shorthand II and Shorthand I was moderate, .619, while the correlation between Shorthand II and tenth grade English grade was low, .329. It was found that three other variables showed substantial relationships with Shorthand II yet were not included in the multiple correlation calculation using the Wherry-Doolittle Test Selection method.

Shorthand II grade Turse Total Score	=	.524
Shorthand II grade Overall Grade-Point Average	=	.438
Shorthand II grade Word Discrimination	=	.405

From Table 12, it is also interesting to note that the correlations obtained from this group of students for Shorthand I grade and Phonetic Association showed a marked relationship with a correlation of .734. There is also a substantial relationship between Shorthand I grade with Word Discrimination, .507; and with Turse Total Score, .640. Spelling showed a low correlation, .242, as did Symbol Transcription, .327. Tenth grade English grade showed a small relationship to Shorthand I,

.147. The subtests of Phonetic Association and Word Discrimination may be a source of prediction. However, another study should be made in order to determine whether this would be beneficial.

Multiple Regression Equation. The final regression equation in score form was:

A = .540B + .220C

(A = Shorthand II Grade; B = Shorthand I Grade; C = Tenth Grade English Grade) Appendix L is the analysis of actual Shorthand II grades and the predicted Shorthand II grades, which were predicted from the multiple regression equation. The results indicated that the predictions were only 50 per cent accurate. Thirteen of the 26 students actually received the grade predicted. Because only half the predictions were accurate, this equation could be considered a chance formula and would not be worth the time involved in its calculations.

Turse Pretest and Post Test Results

Because the Turse Test was administered to Group III twice, it was necessary to find the reliability coefficient of this test. The reliability coefficient for the Turse Test was computed by the Test-Retest method and was found to be .904. In Table 15, the scores on the pretest and the post test are given. It is interesting to note that each student increased her total score from the pretest to the post test.

TABLE 15. GROUP III SCORES FOR THE TURSE SHORTHAND APTITUDE TEST ON THE PRETEST GIVEN IN MAY, 1969: Part A

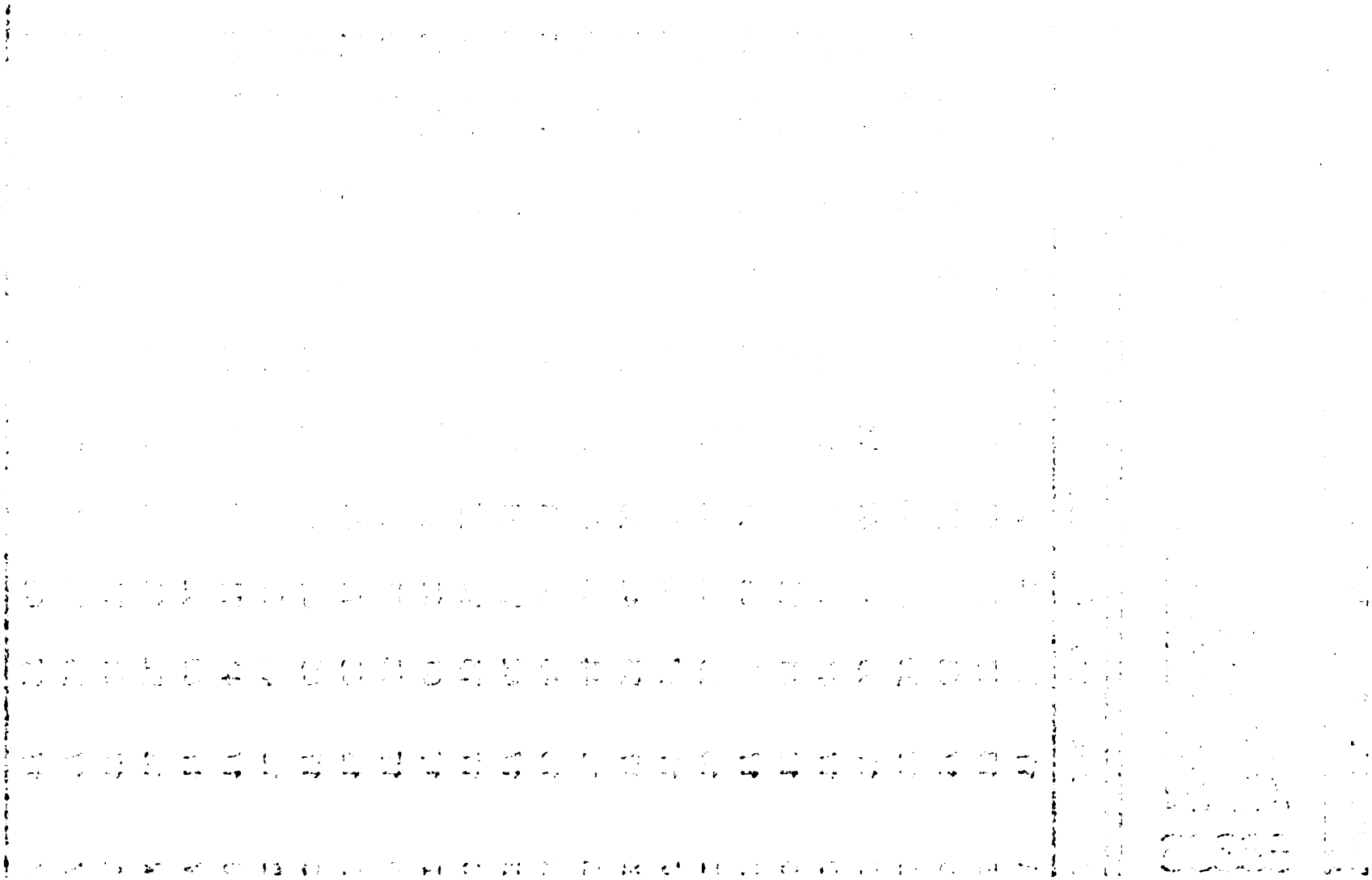
(1) Stroking
(2) Spelling
(3) Phonetic Association
(4) Symbol Transcription
(5) Word Discrimination
(6) Dictation
(7) Word Sense
(8) Total Score
(9) Percentile
S Student

S	Age	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	17	46	64	39	60	42	66	30	347	68
B	17	52	72	48	92	36	70	33	403	91
C	16	47	76	37	52	42	70	40	364	75
D	17	45	80	54	76	36	60	34	385	86
E	16	69	62	35	78	24	56	31	355	73
F	16	40	72	40	52	34	56	39	333	60
G	17	40	64	40	66	42	55	25	332	60
H	16	48	62	36	66	34	62	34	342	65
I	17	52	82	31	76	30	60	26	357	73
J	16	56	66	43	76	36	72	30	379	83
K	16	52	40	30	58	32	70	30	312	49
L	17	47	76	40	54	30	67	28	342	65
M	17	49	78	45	82	34	62	29	379	83
N	16	56	72	45	68	34	67	40	382	84
O	16	70	68	36	74	16	66	30	360	75
P	16	55	56	33	42	26	66	21	299	40
Q	16	65	68	38	42	24	68	25	330	60
R	17	60	80	38	58	38	69	33	376	83
S	17	54	80	58	68	34	60	39	393	88
T	17	46	72	32	54	28	73	45	350	70
U	16	44	68	55	66	48	73	48	402	91
V	16	54	60	46	64	34	63	37	358	73
W	17	46	72	32	54	28	73	45	350	70
X	16	55	68	38	74	46	77	32	391	88
Y	16	57	70	39	56	28	68	33	351	70
Z	16	50	72	41	50	20	58	32	323	54

TABLE 15. GROUP III SCORES FOR THE TURSE SHORTHAND APTITUDE TEST ON THE POST TEST GIVEN IN MARCH, 1970: Part B

(1) Stroking
(2) Spelling
(3) Phonetic Association
(4) Symbol Transcription
(5) Word Discrimination
(6) Dictation
(7) Word Sense
(8) Total Score
(9) Percentile
S Student

S	Age	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	17	53	74	45	92	48	67	42	421	96
B	18	63	74	51	94	42	72	40	436	98
C	17	65	74	55	54	34	65	36	385	86
D	18	50	86	56	66	42	63	41	404	91
E	17	53	74	47	74	24	68	32	374	80
F	17	43	74	44	52	36	56	40	345	68
G	18	41	76	45	76	36	57	27	358	73
H	17	50	66	37	66	36	64	34	353	70
I	18	55	82	30	94	36	65	25	396	90
J	17	57	80	47	94	30	72	29	409	92
K	17	53	42	35	60	38	71	36	335	63
L	18	44	84	45	80	28	66	29	376	83
M	18	49	80	51	94	34	62	33	403	91
N	17	62	73	51	88	28	59	32	398	90
O	17	73	70	35	80	24	60	30	372	80
P	17	61	60	37	46	28	60	26	326	57
Q	17	68	72	38	36	26	74	30	344	65
R	18	69	76	44	76	44	75	45	429	97
S	17	65	84	57	94	40	67	45	452	99
T	18	45	68	40	90	28	71	41	387	86
U	17	41	74	57	94	46	75	48	437	98
V	17	60	52	48	90	24	70	36	380	84
W	18	52	68	44	64	32	75	35	366	78
X	17	61	74	48	94	50	81	27	435	98
Y	17	55	72	52	78	38	49	40	384	84
Z	17	57	68	36	70	30	57	35	353	70



The "Difference Method" was used to discover the significance of the difference between the means.[51] (See Appendix M for data.) The mean difference between the pretest and post test was 29. The t score of 9.676 was far greater than the 2.06 and 2.79 at the .05 and .01 levels of confidence respectively. Because the t score of 9.676 was greater than the 2.79, the difference in pretest and post test scores can be said to be significant. The difference in the pretest and post test scores evidently indicates the Turse Test was measuring achievement rather than operating only as a predictive device.

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[51] Ibid., p. 226-28.

CHAPTER V

SUMMARY AND CONCLUSIONS

Statement of Purpose

Because the failure/dropout rate in Shorthand I (first year) classes at Lakeview High School is extremely high, the purpose of this study was to determine whether one and/or a combination of variables (the student's tenth grade English grade, overall grade-point average, Turse Shorthand Aptitude Test with four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination) could be used as a means of predicting shorthand success (grades of "C" or higher in Shorthand I). The study was divided into three groups.

Group I contained 55 students enrolled in Shorthand I who did not take the Turse Test; tenth grade English grades and overall grade-point averages were available. These two variables were used to determine whether or not one or both could serve as predictors for success in Shorthand I.

Group II contained 34 of these 55 students who were enrolled in Shorthand I at the start of the second semester. These students had taken the Turse Test; their

tenth grade English grades and overall grade-point averages were also available. It was necessary to determine whether any or all of these variables could be used in predicting Shorthand I success.

Group III contained 26 students who were enrolled in Shorthand II (second year). These students had taken the Turse Test during the second semester of Shorthand I and during the second semester of Shorthand II. Eleven of these 26 students were not in the writer's Shorthand I classes, but they were included because they had taken the Turse Test in 1969. Their tenth grade English grade, overall grade-point average, the Turse Test with four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination, and the Shorthand I grade were the variables used. It was necessary to determine whether any or all of these variables could be used as predictors of Shorthand II success.

Analyses and Conclusions

Group I. From the group of 55 students in Shorthand I, the coefficients of correlation between Shorthand I and tenth grade English grade was .329 and between Shorthand I and overall grade-point average, .642. Therefore, overall grade-point average showed a substantial relationship with Shorthand I success.

Eliminations of successes and failures were also made using arbitrarily set cut-off points for these two variables. The cut-off point of "D" in tenth grade English grade was obtained; a grade of "D" in English does not seem to be very discriminating as a means of selection. The cut-off point for overall grade-point average was found to be 1.75. These cut-off points were set because they eliminated the greatest number of failures and the least number of successes in the sample. In combining these two variables, both cut-off points remained the same.

Group II. From the coefficients of correlation between Shorthand I and the variables of tenth grade English grade, overall grade-point average, Turse Test with the four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination, the correlations which showed substantial relationships were those of overall grade-point average and Phonetic Association. The correlation of Shorthand I success with overall grade-point average was again moderate with an r of .569. Phonetic Association had a correlation of .560 with Shorthand I success.

The cut-off points for this group were the same as for Group I: "D" in tenth grade English grades and 1.75 for overall grade-point averages. It was found that the Turse Test did not discriminate successes from failures

as accurately as was hoped. If a cut-off point must be set, it would be 320 for the Turse total score. If the tenth grade English grade, overall grade-point average, and Turse Test were available to be used in selecting prospective Shorthand I students, the respective cut-off points would be "D", 1.75, and 320.

Group III. From the sample of 26 Shorthand II students, the coefficients of correlation which showed moderate relationships from among the variables of tenth grade English grade, overall grade-point average, Turse Test with four selected subtests of Spelling, Phonetic Association, Symbol Transcription, and Word Discrimination, and Shorthand I grade, to the criterion, Shorthand II, were those of Shorthand I, .619; Turse Test, .524; overall grade-point average, .488; and Word Discrimination, .405.

A multiple correlation analysis was made using the Wherry-Doolittle method. Shorthand I grade and tenth grade English grade were the only variables used in this correlation. The R was found to be .622, corrected for chance errors.

A multiple regression equation was then set up. The results of this equation were not satisfactory as only 50 per cent of the predicted grades for Shorthand II were actually obtained by the students in the course.

Recommendations

1. It is recommended that this study be repeated. Because the sample was small, the results are not significant. The Turse Test should be given at the beginning of the school year in order to make inferences from it as a pretest.

2. It is recommended that the variables of tenth grade English grade, overall grade-point average, and the Turse Shorthand Aptitude Test in its entirety should be used in the next study.

Because Lakeview has instituted a new grading system which began this year for sophomores, it is hoped that this system will prove more reliable. In the past, a "C-" and a "C+" were counted as "C's". In the future, the minuses and the pluses will remain and may help bring considerable reliability to studies of this nature.

The English curriculum has also been under revision; this may influence the relationship between tenth grade English and shorthand.

3. It is recommended that the counseling staff of Lakeview High School maintain the following prerequisites in the enrollment of Shorthand I students:

a) Tenth grade English grade not lower than "D"

b) Overall grade-point average not lower than 1.75

c) Turse total score not lower than 320

One or another of the above mentioned variables may be relatively higher than the minimum stated while another may be slightly lower than the minimum stated. Moreover, students who may have an earnest desire to enroll in shorthand may succeed in spite of deficiencies; therefore, counselors should carefully consider these highly motivated students for Shorthand I.

APPENDIX A

ANALYSIS OF GROUP I STUDENTS ON AGE, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND SHORTHAND I FIRST SEMESTER GRADE

APPENDIX A. ANALYSIS OF GROUP I STUDENTS ON AGE, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, AND SHORTHAND I FIRST SEMESTER GRADE

(1) Student
(2) Age
(3) Tenth Grade English Grade
(4) Overall Grade-Point Average
(5) Shorthand I First Semester Grade

(1)	(2)	(3)	(4)	(5)
A	17	D	1.63	C
B	17	A	3.90	A
C	17	C	2.20	A
D	16	B	2.13	E
E	17	C	2.30	D
F	18	C	2.25	B
G	17	D	1.38	E
H	16	B	3.40	A
I	17	C	2.38	E
J	17	C	1.50	B
K	16	B	2.60	C
L	17	D	2.30	C
M	17	D	2.13	C
N	17	C	2.38	C
O	18	B	2.00	D
P	17	C	1.63	D
Q	17	C	1.63	D
R	16	B	2.00	C
S	16	B	2.50	B
T	17	C	1.75	E
U	16	D	1.88	E
V	16	D	1.75	C
W	17	C	2.50	A
X	17	B	1.67	E
Y	17	A	2.13	C
Z	16	C	1.88	D

APPENDIX A. (continued)

(1)	(2)	(3)	(4)	(5)
AA	17	B	1.75	B
BB	16	D	1.75	C
CC	17	B	3.38	B
DD	16	C	1.75	B
EE	17	E	1.25	E
FF	17	B	3.40	B
GG	17	B	2.80	B
HH	17	A	3.10	A
II	16	B	2.50	E
JJ	17	B	3.00	B
KK	17	C	1.38	D
LL	17	B	2.40	C
MM	16	B	2.13	D
NN	17	B	2.56	D
OO	17	C	2.94	C
PP	17	B	3.11	B
QQ	18	C	2.05	C
RR	16	A	3.63	B
SS	16	C	1.75	C
TT	18	D	2.00	E
UU	16	D	1.75	B
VV	17	B	1.78	D
WW	16	C	1.75	C
XX	17	D	2.00	E
YY	16	B	1.80	C
ZZ	17	C	1.50	D
AZ	17	D	1.25	E
BZ	17	B	3.60	B
CZ	16	D	1.50	E

APPENDIX B

DATA OF GROUP I FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN MAY SOCIAL POLL

APPENDIX B. DATA OF GROUP I FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN RAW SCORE FORM

(1) Sum of Scores
(2) Sum of Squared Scores
(3) Mean Score
(4) Standard Deviation

(A) Tenth Grade English Grade
(B) Overall Grade-Point Average
(C) Shorthand I First Semester Grade

	(1)	(2)	(3)	(4)
(A)	1,662.00	55,020.00	28.00	9.34
(B)	118.98	291.07	2.16	.78
(C)	1,653.00	54,425.00	31.00	9.29

APPENDIX C

SCALING OF LETTER GRADES INTO METRIC VALUES FOR TENTH GRADE ENGLISH GRADES AND SECONDARY I GRADES FOR GROUP I

APPENDIX C. SCALING OF LETTER GRADES INTO NUMERIC VALUES FOR TENTH GRADE ENGLISH GRADES AND SHORTHAND I GRADES FOR GROUP I

A Letter Grade
B Letter Grade
C Letter Grade
D Letter Grade
E Letter Grade
(1) % Having
(2) Equivalent σ Values
(3) Weight

	A	B	C	D	E
	Tenth Grade English Grades				
(1)	7.	36.	33.	22.	2.
(2)	1.92	.72	- .25	- 1.19	- 2.44
(3)	49.00	37.00	28.00	18.00	6.00
	Shorthand I Grades				
(1)	9.	24.	27.	18.	22.
(2)	1.81	.83	.09	- .50	- 1.35
(3)	48.00	38.00	31.00	25.00	17.00

APPENDIX D

ANALYSIS OF GROUP II STUDIES ON AGE, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, EXAM ELSP AND SCHOLARD I GRADE

APPENDIX D. ANALYSIS OF GROUP II STUDENTS ON AGE, TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, TURSE TEST, AND SHORTHAND I GRADE

(1) Student
(2) Age
(3) Tenth Grade English Grade
(4) Overall Grade-Point Average
(5) Stroking Subtest
(6) Spelling Subtest
(7) Phonetic Association Subtest
(8) Symbol Transcription Subtest
(9) Word Discrimination Subtest
(10) Dictation Subtest
(11) Word Sense Subtest
(12) Total Score
(13) Percentile
(14) Shorthand I Grade (Second Semester)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A	17	D	1.63	40	54	33	68	18	66	27	306	46	D
B	17	A	3.90	52	72	48	92	36	70	33	403	91	A
C	17	C	2.20	42	60	33	64	28	48	26	301	43	B
F	18	C	2.25	65	68	38	40	30	77	30	348	68	C
H	16	B	3.40	54	60	46	64	34	63	37	358	73	A
J	17	C	1.50	46	72	32	54	28	73	45	350	70	B
K	16	B	2.60	62	64	25	84	22	64	24	345	68	D
L	17	D	2.30	60	80	52	92	38	56	39	417	95	C
M	17	D	2.13	56	78	48	80	44	85	36	427	97	C
N	17	C	2.38	61	66	30	82	30	57	31	357	73	C
R	16	B	2.00	69	62	35	78	24	56	31	355	73	C
S	16	B	2.50	56	68	38	74	46	77	32	391	88	B
V	16	D	1.75	49	68	29	84	42	64	31	367	78	D

APPENDIX D. (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
W	17	C	2.50	45	80	54	76	36	60	34	385	86	B
Y	17	A	2.13	58	78	46	80	30	72	44	408	92	D
Z	16	C	1.88	57	70	39	56	28	68	33	351	70	C
AA	17	B	1.75	46	72	32	54	28	73	45	350	70	C
BB	16	D	1.75	61	68	44	92	30	53	37	385	86	C
CC	17	B	3.38	46	64	39	60	42	66	30	347	68	B
DD	16	C	1.75	55	70	42	70	34	58	26	355	73	C
FF	17	B	3.40	47	76	37	52	42	70	40	364	75	C
GG	17	B	2.80	60	80	38	58	38	69	33	376	83	B
HH	17	A	3.10	54	80	58	68	34	60	39	393	88	A
JJ	17	B	3.00	46	72	32	54	28	73	45	350	70	B
LL	17	B	2.40	49	76	40	78	34	74	48	399	90	B
OO	17	C	2.94	80	54	43	44	30	75	33	359	73	B
PP	17	B	3.11	52	82	31	76	30	60	26	357	73	C
QQ	18	C	2.05	45	56	35	44	36	59	35	310	49	C
RR	16	A	3.63	54	60	46	64	34	63	37	358	73	A
SS	16	C	1.75	45	64	26	58	32	66	26	317	52	D
UU	16	D	1.75	44	68	55	66	48	73	48	402	91	A
WW	16	C	1.75	56	72	45	68	34	67	40	382	84	C
YY	16	B	1.80	70	68	36	74	16	66	30	360	75	C
BZ	17	B	3.60	58	68	39	72	48	59	32	376	83	B

APPENDIX E

DATA OF GROUP II FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN RAW SCORE FORM

APPENDIX E. DATA OF GROUP II FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN RAW SCORE FORM

(1) Sum of Scores
(2) Sum of Squared Scores
(3) Mean Score
(4) Standard Deviation
(A) Tenth Grade English Grade
(B) Overall Grade-Point Average
(C) Turse Total Scores
(D) Spelling
(E) Phonetic Association
(F) Symbol Transcription
(G) Word Discrimination
(H) Shorthand I Grade (Second Semester)

	(1)	(2)	(3)	(4)
(A)	1,063.00	36,011.00	31.20	9.04
(B)	82.76	216.93	2.43	.67
(C)	12,409.00	4,559,359.00	364.87	29.92
(D)	2,348.00	164,136.00	69.10	7.64
(E)	1,344.00	55,402.00	39.50	8.17
(F)	2,320.00	164,688.00	68.20	13.70
(G)	1,132.00	39,648.00	33.33	7.59
(H)	1,029.00	34,129.00	30.20	9.37

APPENDIX F

SCALING OF LETTER GRADES INTO NUMBERED VALUES FOR TENTH GRADE ENGLISH GRADES AND SHORTHAND I GRADES FOR GROUP II

APPENDIX F. SCALING OF LETTER GRADES INTO NUMERIC VALUES FOR TENTH GRADE ENGLISH GRADES AND SHORTHAND I GRADES FOR GROUP II

A Letter Grade
B Letter Grade
C Letter Grade
D Letter Grade
E Letter Grade
(1) % Having
(2) Equivalent σ Values
(3) Weight

	A	B	C	D	E
	Tenth Grade English Grades				
(1)	4.	13.	11.	6.	0.
(2)	1.67	.52	0.	-1.46	
(3)	47.00	35.00	30.00	15.00	
	Shorthand I Grades				
(1)	5.	10.	14.	5.	0.
(2)	1.56	.56	- .39	-1.56	
(3)	46.00	36.00	26.00	15.00	

APPENDIX G

ANALYSIS OF GROUP III STUDENTS ON TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, SHORTHAND I GRADE, AND SHORTHAND II GRADE

APPENDIX G. ANALYSIS OF GROUP III STUDENTS ON TENTH GRADE ENGLISH GRADE, OVERALL GRADE-POINT AVERAGE, SHORTHAND I GRADE, AND SHORTHAND II GRADE

(1) Student
(2) Tenth Grade English Grade
(3) Overall Grade-Point Average
(4) Shorthand I Grade
(5) Shorthand II Grade

(1)	(2)	(3)	(4)	(5)
A	B	3.38	B	A
B	A	3.90	A	A
C	C	2.88	B	B
D	B	3.00	A	B
E	B	2.30	C	C
F	B	2.20	C	C
G	B	2.88	B	C
H	A	2.88	C	C
I	B	3.11	C	B
J	B	2.25	B	B
K	C	2.75	C	D
L	C	2.13	C	C
M	B	2.40	B	C
N	C	1.75	C	C
O	B	1.80	C	C
P	B	2.63	C	C
Q	C	2.00	B	C
R	B	2.80	B	C
S	A	3.10	A	B
T	B	3.00	B	C
U	D	1.75	A	B
V	B	3.40	A	A
W	C	1.50	B	B
X	B	2.50	B	C
Y	B	1.75	C	C
Z	C	1.63	C	D

APPENDIX H

DATA OF GROUP III FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN RAW SCORE FORM

APPENDIX H. DATA OF GROUP III FOR SUM OF SCORES, SUM OF SQUARED SCORES, MEAN SCORE, AND STANDARD DEVIATION IN RAW SCORE FORM

(1) Sum of Scores
(2) Sum of Squared Scores
(3) Mean Score
(4) Standard Deviation
(A) Tenth Grade English Grade
(B) Overall Grade-Point Average
(C) Turse Total Score
(D) Spelling Score
(E) Phonetic Association Score
(F) Symbol Transcription Score
(G) Word Discrimination Score
(H) Shorthand I Grade
(I) Shorthand II Grade

	(1)	(2)	(3)	(4)
(A)	784.00	25,826.00	30.00	9.17
(B)	65.67	175.75	2.53	.62
(C)	9,295.00	3,341,509.00	357.50	26.71
(D)	1,800.00	126,632.00	69.23	8.81
(E)	1,049.00	43,663.00	40.34	7.18
(F)	1,658.00	109,612.00	63.76	12.22
(G)	856.00	29,640.00	32.92	7.48
(H)	740.00	23,080.00	28.00	8.81
(I)	842.00	29,052.00	32.00	9.28

APPENDIX I

SCALING OF LETTER GRADES INTO NUMERIC VALUES FOR TENTH GRADE ENGLISH GRADES, SHORTHAND I GRADES, AND SHORTHAND II GRADES FOR GROUP III

APPENDIX I. SCALING OF LETTER GRADES INTO NUMERIC VALUES FOR TENTH GRADE ENGLISH GRADES, SHORTHAND I GRADES, AND SHORTHAND II GRADES FOR GROUP III

A Letter Grade
B Letter Grade
C Letter Grade
D Letter Grade
E Letter Grade
(1) % Having
(2) Equivalent σ Values
(3) Weight

	A	B	C	D	E
	Tenth Grade English Grades				
(1)	11.	58.	27.	4.	0
(2)	1.71	.28	- .99	-2.16	
(3)	47.00	33.00	20.00	8.00	0
	Shorthand I Grades				
(1)	19.	39.	42.	0.	0
(2)	1.43	.00	- .93		
(3)	44.00	39.00	20.00	0	0
	Shorthand II Grades				
(1)	11.	27.	54.	8.	0
(2)	1.71	.71	.00	-1.86	
(3)	47.00	37.00	30.00	11.00	0

APPENDIX J

STEPS IN THE WHERRY-DOOLITTLE TEST SELECTION METHOD

STEP 1. CORRELATION COEFFICIENTS WITH SIGNS REVERSED

(1) Tenth Grade English Grade
(2) Overall Grade-Point Average
(3) Turse Total Score
(4) Spelling
(5) Phonetic Association
(6) Symbol Transcription
(7) Word Discrimination
(8) Shorthand I Grade
V_1 Shorthand I Selection
V_2 Tenth Grade English Grade Selection
V_3 Turse Total Score Selection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
V_1	-.329	-.488	-.524	-.306	-.375	-.358	-.405	-.619
V_2	-.238	-.208	-.123	-.156	+.079	-.156	-.091	
V_3		-.074	-.109	-.138	+.079	-.061	-.108	

STEP 2. COMPUTATION OF THE Z FIGURE

(1) Tenth Grade English Grade
(2) Overall Grade-Point Average
(3) Turse Total Score
(4) Spelling
(5) Phonetic Association
(6) Symbol Transcription
(7) Word Discrimination
(8) Shorthand I Grade
Z_1 Shorthand I Selection
Z_2 Tenth Grade English Grade Selection
Z_3 Turse Total Score Selection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Z_1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Z_2	.978	.796	.599	.941	.461	.893	.743	
Z_3		.483	.584	.936	.461	.739	.738	

STEP 3. COMPUTATION OF THE V_m^2 / Z_m^2 QUANTITY AND NEGATIVE RECIPROCAL

V_1 and Z_1 Shorthand I Selection
V_2 and Z_2 Tenth Grade English Grade Selection
V_3 and Z_3 Turse Total Score Selection

$$\frac{V_1^2}{Z_1^2} = \frac{(-.619)^2}{1.000} = .383$$

$$\frac{V_2^2}{Z_2^2} = \frac{(-.238)^2}{.978} = .058$$

$$\frac{V_3^2}{Z_3^2} = \frac{(-.109)^2}{.584} = .020$$

$$\text{Negative Reciprocal} = \frac{1}{.978} = -1.022$$

STEP 4. APPLICATION OF THE WHERRY SHRINKAGE FORMULA

m = Number of Variables

$\frac{V_m^2}{Z_m^2}$ = Measure of Amount Which Selected Variable Contributes to Squared Multiple Correlation Coefficient

N = Number in Sample

K^2 = Constant

$\overline{K}^2$ = Corrected for Inflated Multiple $\underline{R}$

$\overline{R}^2$ = Shrunken Multiple Correlation Coefficient

$\overline{R}$ = Multiple Correlation Coefficient

A = Shorthand I Grade

B = Tenth Grade English Grade

C = Terse Total Score

m	$\frac{V_m^2}{Z_m^2}$	K^2	$\frac{N-1}{N-m}$	$\overline{K}^2$	$\overline{R}^2$	$\overline{R}$	Variable
0		1.000	(N=26)				
1	.383	.617	1.000	.617	.383	.619	A
2	.058	.559	1.041	.582	.418	.646	B
3	.020	.534	1.087	.586	.415	.644	C

STEP 5. WORK SHEET FOR WHERRY-DOOLITTLE TEST SELECTION METHOD

(1) Tenth Grade English Grade
(2) Overall Grade-Point Average
(3) Nurse Total Score
(4) Spelling
(5) Phonetic Association
(6) Symbol Transcription
(7) Word Discrimination
(8) Shorthand I Grade
(9) Shorthand II Grade
(10) Check Sum

(11) Variable Number
a_1 Blank
a_2 Reliability coefficient with Shorthand II
b_1 Reliability coefficient with Shorthand II
b_2 Algebraic answer*
c_1 Coefficients with signs reversed
c_2 Algebraic answer**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
a_1	-	-	-	-	-	-	-	-	-	-	
b_1	.147	.452	.640	.242	.734	.327	.507	1.000	-.619	3.430	
c_1	-.147	-.452	-.640	-.242	-.734	-.327	-.507	-1.000	+.619	-3.430	8
a_2	1.000	.620	.172	.110	.105	.437	.005	.147	-.329	2.267	
b_2	.978	.554	.078	.074	-.003	.389	-.070		-.238	1.763	
c_2	-1.000	-.566	-.080	-.076	+.003	-.396	+.071		+.243	-1.802	1

*b_2 = a_2 + b_1 (given variable) x c_1 (second selected variable)

**c_2= b_2 x the negative reciprocal of the b_2 entry for the second selected variable

APPENDIX K

STEPS IN THE MULTIPLE REGRESSION EQUATION

STEP 1. FINDING THE BETA WEIGHTS

A = Shorthand I Grade
B = Tenth Grade English Grade
C = Shorthand II Grade
c_1 = Shorthand I Selection
c_2 = Tenth Grade English Selection

	A	B	C
c_1	-1.000	- .147	+.619
c_2	-	-1.000	+.243

(c_m is found by multiplying each b_m entry by the negative reciprocal of the b_m entry for the m^{th} selected variable.

STEP 2. EQUATIONS FOR BETA WEIGHTS

Shorthand I Grade = $-1.000\beta_{Sht.} - .147\beta_{Eng.} + .619 = 0$

English Grade = $-1.000\beta_{Eng.} + .243 = 0$

Shorthand I Grade (Beta Weight) = .583
Tenth Grade English Grade (Beta Weight) = .243

STEP 3. TRANSFORMING BETA WEIGHTS INTO b's

Formula: $\underset{\text{(Shorthand I)}}{b} = \dfrac{\sigma_{\text{Sht. II}}\beta_{\text{Sht.I}}}{\sigma_{\text{Sht.I}}} = .548$

(Tenth Grade English Grade) $\dfrac{\sigma_{\text{Sht. II}}\beta_{\text{Eng.}}}{\sigma_{\text{Eng.}}} = .220$

STEP 4. FINAL MULTIPLE REGRESSION EQUATION

A = Shorthand II Grade
B = Shorthand I Grade
C = Tenth Grade English Grade

$$A = .548B + .220C$$

STEP 5. FORMULA FOR CHECKING THE BETA WEIGHTS

$$R^2 = \beta_{\text{Sht. I}} \times r_{\text{Sht. I \& Sht. II}} + \beta_{\text{Eng.}} \times r_{\text{Eng. \& Sht. II}}$$

$$R^2 = .619 \times .548 + .220 \times .329$$

$$R^2 = .412$$

$$R = .642$$

STEP 6. CALCULATED R CORRECTED FOR CHANCE ERRORS

$$\bar{R}^2 = \frac{(n - 1)R^2 - (m - 1)}{(n - m)}$$

$$\bar{R}^2 = \frac{25 \times .4116 - 1}{24}$$

$$\bar{R}^2 = .3871$$

$$\bar{R} = .6222$$

APPENDIX L

ANALYSIS OF ACTUAL SHORTHAND II GRADES AND PREDICTED SHORTHAND II GRADES FROM THE MULTIPLE REGRESSION EQUATION FOR GROUP III

APPENDIX L. ANALYSIS OF ACTUAL SHORTHAND II GRADES AND PREDICTED SHORTHAND II GRADES FROM THE MULTIPLE REGRESSION EQUATION FOR GROUP III

(1) Student
(2) Actual Shorthand II Grade
(3) Predicted Shorthand II Grade
(4) Assessment (- No Correlation)
(+ Is Correlation)

(1)	(2)	(3)	(4)
A	A	B	-
B	A	A	+
C	B	B	+
D	B	A	-
E	C	C	+
F	C	C	+
G	C	B	-
H	C	B	-
I	B	C	-
J	B	B	+
K	D	C	-
L	C	C	+
M	C	B	-
N	C	C	+
O	C	C	+
P	C	C	+
Q	C	B	-
R	C	B	-
S	B	A	-
T	C	B	-
U	B	B	+
V	A	A	+
W	B	B	+
X	C	B	-
Y	C	C	+
Z	D	C	-

APPENDIX M

THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE MEANS OF THE PRETEST AND THE POST TEST ON THE TURSE SHORTHAND APTITUDE TEST FOR GROUP III

APPENDIX M. THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE MEANS OF THE PRESTEST AND THE POST TEST ON THE TURSE SHORTHAND APTITUDE TEST FOR GROUP III

(1) 1969 Pretest Scores
(2) 1970 Post Test Scores
(3) Difference (1970-1969)
(4) Column 3 minus Mean Difference
(5) Column 4 Squared

(1)	(2)	(3)	(4)	(5)
347	421	74	45	2025
403	436	33	4	16
364	385	21	- 8	64
385	404	19	-10	100
355	374	19	-10	100
333	345	12	-17	289
332	358	26	- 3	9
342	353	11	-18	324
357	396	39	10	100
379	409	30	1	1
312	335	23	- 6	36
342	376	34	5	25
379	403	24	- 5	25
382	398	16	-13	169
360	372	12	-17	289
299	326	27	- 2	4
330	344	14	-15	225
376	429	53	24	576
393	452	59	30	900
350	387	37	8	64
402	437	35	6	36
358	380	22	- 7	49
350	366	16	-13	169
391	435	44	15	225
351	384	33	4	16
323	353	30	1	1
9295	10058	763/29		5837

APPENDIX M. (continued)

Mean Difference = 29

Standard Deviation of Difference (SD_D) $= \sqrt{\frac{\Sigma x^2}{(N - 1)}} = \frac{5837}{25} = 15.28$

Standard Error of Mean Difference (SE_{MD}) $= \frac{SD}{\sqrt{N}} = \frac{15.28}{26} = 2.997$

$$t = \left(\frac{D - 0}{SE_{MD}} \right) = \frac{29 - 0}{2.997} = 9.676$$

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