A History of Selected Studies in Shorthand Prognosis from 1914 to 1960

Irene R. Tschider

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A HISTORY OF SELECTED STUDIES IN SHORTHAND PROGNOSIS

FROM 1914 TO 1960

by

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B.S. in Business Education, University of North Dakota 1959

A Thesis
Submitted to the Faculty
of the
Graduate School
of the
University of North Dakota
in partial fulfillment of the requirements
for the Degree of
Master of Science

Grand Forks, North Dakota

June
1960
This thesis, submitted by Irene R. Tschider in partial fulfillment of the requirements for the Degree of Master of Science in the University of North Dakota, is hereby approved by the Committee under whom the work has been done.

John F. Rowe
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Melvin Geuwell

Dean of the Graduate School
ACKNOWLEDGMENTS

I am very grateful to Dr. John L. Rowe for his guidance, assistance, and suggestions given to me in connection with this study.

My appreciation is also extended to Dr. Ruth B. Woolschlager and Dr. Melvin Gruwell for their encouragement and help.
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CHAPTER I

NATURE AND SCOPE OF THE STUDY

Prognosis has long been considered in the field of shorthand. The primary function of prognosis is guidance of students. Prognosis is used in determining probable success or failure in shorthand. The future success and happiness of an individual is often dependent upon proper guidance. The importance of prognosis in shorthand can be seen very readily by the large number of dropouts and failures in this subject. As Di Bona pointed out: "Shorthand failures and dropouts are among the highest in the curriculum of the nation's schools."

Proper selection of students for shorthand would eliminate a great deal of ration and anxiety on the part of teachers and students and would save considerable time and energy. To be of use in guidance of students, prognosis must measure adequately the aptitude, interest, and ability of the student to learn shorthand.

There are three major selection techniques used in prognosis in shorthand as revealed in this study. The first technique deals with prognostic tests. The second technique used for the purpose of selection is that of showing the relationship of school marks attained in other subjects and those attained in shorthand. The

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third technique has to do with exploratory courses which introduce
the student to the subject of shorthand in a short tryout period.

This study reviewed the history of shorthand prognosis by
reviewing selected studies and collecting various opinions expressed
in an attempt to acquaint the reader with the functions of prognosis,
the effort which has been put forth by researchers in prognosis in
shorthand, and to point out the need for further study and better
methods of prognosis.

The Problem

This study constituted a perusal of the professional
education publications concerning shorthand prognosis to obtain
the history of shorthand prognosis from the years 1914 to 1960.

This history included:

a. Selected studies completed in the field of prognosis
   in shorthand.

b. Results obtained from these studies.

c. Opinions voiced by researchers.

d. Opinions voiced by authors, and specialists in the field
   of shorthand concerning shorthand prognosis.

Importance of the Study

Many studies have been conducted in the prognosis of short-
hand. These studies are not new. The problem is not new. Each
year students take shorthand and each year there are many failures
and dropouts. Increased interest has been displayed because of the
problem. Osborne\textsuperscript{1} stated that educators are displaying an increasing

\textsuperscript{1}Agnes E. Osborne, "Guidance Through Prognosis," National
interest in the problem of prognosis, owing to the large percentage of students who fail in each semester's work and to the increased enrollments in the subject.

The students who fail or drop out of shorthand have used considerable time which could have been spent profitably elsewhere. Cowan felt no subject in vocational education had ever used so many man hours in being invented, taught, and learned as shorthand.

Much time and effort has been spent by research workers in an attempt to discover a method or methods upon which to predict shorthand achievement.

Delimitations

a. This study is limited to information found in professional education publications and textbooks pertaining to shorthand prognosis found in the library at the University of North Dakota. Theses and abstracts pertaining to prognosis in shorthand were obtained through inter-library loan.

b. The material was taken from the period of 1914 to 1960; difficulty was encountered in obtaining earlier material.

c. This study was limited to opinions and studies of others, and therefore, does not include recommendations.

d. The data presented is secondary rather than primary.

Scope

This study attempted to trace the history of prognosis in shorthand and to compile opinions relating to prognosis in shorthand. The study traced developments in shorthand prognosis throughout the years beginning in 1914 and ending in 1960. The following areas of prognosis were considered in specific studies and other formal

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research sources of authors and researchers as reviewed in professional publications:

1. Specific prognostic tests
2. Criteria used in testing
   a. English
   b. Exploratory courses
   c. Intelligence quotient
   d. Languages
   e. Other courses in relation to shorthand
   f. Prognostic tests
   g. Typewriting
3. Criteria used in each test or tests
4. Reliance placed on these criteria and order of importance given to them.

Definitions

A number of terms were used which were related to the areas of shorthand prognosis. The following are defined in terms of their relationship to the topics in this study. These definitions were obtained from Good's Dictionary of Education with the exception of those marked by an asterisk which were developed by the writer.

Achievement Test is a test designed to measure a person's knowledge, skills, understandings, and so forth.

Aptitude is a group of characteristics, native or acquired, deemed to be symptomatic of an individual's ability to acquire proficiency

in a given area; examples might be a particular art, school subject, or vocational area.

**Aptitude.** The ability to recognize blends or combinations of sounds in various words; ability to identify and remember component sounds and to recall words containing such sounds.

**Coefficient of Correlation** is a pure number, varying usually from 1 through 0 to -1, that denotes the degree of relationship existing between two (or more) series of observations.

**Intelligence Quotient** is the most commonly used device for expressing level of mental development in relation to chronological age; obtained by dividing the mental age (as measured by general intelligence test) by the chronological age and multiplying by 100.

**Manual Dexterity** is the capacity for muscular coordination.

**Mark** is a rating of achievement assigned on the basis of scales; it is the teacher's numerical or letter evaluation.

**Mean** is a measure of central tendency; strictly any one of several calculated averages, including the arithmetic mean, the geometric mean, and the harmonic mean.

**Median** is the point on the scale of a frequency distribution at which or below which (also, at which or above which) 50 per cent of the observations occur; used as a measure of central tendency.

**Motility** is the extent to which a student displays spontaneous movement. It is the ability to make motion.

**Norms** are standards or criteria; for example, test norms give information about the performance of a particular group on a particular test and thereby provide a set of criteria against which can be compared the performance of any individual taking that particular test.
Prognosis is the attempt to forecast the aptitude of students for probable success or failure in the learning of shorthand.

Prognosis, vocational is an estimate of the future vocational success of an individual or group of individuals based on past performance or scores on predictive measures.

Prognostic Test is a test intended to predict a person's probable success or aptitude for a given line of endeavor, as indicated by present performance; to be distinguished from aptitude test, which is only one of several types of prognostic tests.

Reliability is the accuracy with which a measuring device measures something; the degree to which a test or other instrument of evaluation measures stably or consistently whatever it does in fact measure.
CHAPTER II

PROCEDURES

The procedures herein explained were used to obtain materials necessary in conducting an intensive study of literature pertaining to the history of prognosis in shorthand. This history included the developments in prognosis in shorthand and the opinions of authors and researchers pertaining to prognosis in shorthand.

The study began with a thorough examination of the 1940 to 1960 issues of the Business Education Index. All articles pertaining to prognosis in shorthand were examined. The next step was to collect all articles containing conflicting opinions in the area of prognosis in shorthand. Included in this list were studies conducted in areas related to this study. All periodicals listed in the Business Education Department Library and the Library of the University of North Dakota were examined. A bibliography was developed on 4 x 5 index cards which contained the name of the author, the title of the article, the source title, the date of publication, and the page numbers of the located materials. The material on the cards pertained to conflicting opinions in prognosis in shorthand. See Exhibit A. Considerable time and research had been spent in this area of

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Teacher and counselor might well ask, "What criteria are used for prognosis? Are they reliable?"

1. I.Q. and school marks have some value for prediction. The danger is that the counselor might place too high a value on their usage for prediction. Students have shown that I.Q.'s yield co-efficient of correlations with teacher's marks in a range from .40 to .60; coefficients cluster around .48.

shorthand. After evaluating and classifying these materials, this was found to be an incomplete and therefore unsatisfactory method of conducting this study. This method failed to cover inadequately the research in prognosis in shorthand and the opinions expressed pertaining to prognosis in shorthand.

Research studies had been conducted and opinions had been expressed regarding shorthand earlier than 1940, therefore, the study was extended back to 1914 and was extended to studies in prognosis in shorthand as well as opinions.

A further investigation revealed that the Business Education Indexes available in the general library of the University of North Dakota began in 1940. Therefore it was necessary to obtain the
majority of references from theses obtained from other graduate schools through inter-library loan.

The presentation of research materials presented a problem. The first method of presentation attempted was that of classifying the various factors used in studies pertaining to prognosis in shorthand. The results obtained from the factors and opinions expressed on the various factors were included in this classification. This procedure proved to be confusing and repetitive and was abandoned at the expense of considerable time.

The next method attempted and eventually used for the presentation was that of arranging the material chronologically. Index cards containing the date, the author, the article title, source title, and the page numbers of the materials were typed on 4 x 6 index cards and were arranged chronologically. See Exhibit B. The material from these cards was then transferred in a detailed chronological summary of each source to a notebook which was used to compose a rough draft of this study, and eventually a final draft.
1950 - November


Teacher and counselor might well ask, "What criteria are used for prognosis. Are they reliable?"

1. I. Q. and school marks have some value for prediction. The danger is that the counselor might place too high a value on their usage for prediction. Students have shown that I. Q.'s yield co-efficients of correlations with teacher's marks in a range from .40 to .60; coefficients cluster around .48.
CHAPTER III

REPORT OF THE FINDINGS

Prognosis in shorthand was traced by years for the purposes of clarity and readability. It was summarized at the end of each ten-year period with the exception of the very early years from 1914 to 1930.

Prognostic tests are not new. Symonds\(^1\) reported the first prognostic test was constructed by Kelly in 1914, and since that time many attempts have been made to construct tests to measure accurately specific traits.

In 1917, Rogers\(^2\) administered ten psychological tests which measured the speed of mental functions or processes to forty-five students of typewriting and shorthand in the Extension Department of Columbia University. Nine of the tests were taken from the group standardized for the American Psychological Corporation by Woodward and Wells and the tenth was one of the Trabue Language Tests. Measure of stenographic ability included the instructor's

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mid-year grades in shorthand; examination grades in grammar, including
spelling, punctuation, letter writing, paragraphing; and the objective
scores made each month in typewriting exercises. Correlations on
these tests with stenographic marks, which were the criterion of
success in the study of shorthand, ranged from .07 on the Number
Checking Test to .46 on the Hard Directions Test. A correlation of
.53 was found to exist between all the tests and the grammar
criterion. Rogers concluded that, while the correlations were low,
this method produced a far more reliable criterion for vocational
guidance in the field of stenography than had ever been previously
attained and that further study might develop a better criterion
for a system of vocational guidance and selection for stenographic
positions.

One of the first prognostic studies was conducted for the
purpose of predicting success in a stenographic course and probable
success in the business world. In 1921, Bills gave his entire
class of eighty shorthand students three tests: a general intelli-
gence test, a special aptitude test in shorthand and typewriting,
and the Downey-Will-Temperament Test. His findings were as follows:

1. A battery of tests was more effective than any single test
   both in eliminating failures and in predicting successes.

2. Of the single tests, the General Intelligence test was the
   most reliable in eliminating failures.

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1W. A. Bills, "A Test for Use in the Selection of Comptometer
Operators and Stenographers," Journal of Applied Psychology, V,
(September, 1921), pp. 275-283. Citing from Marie E. Youngerman,
"Shorthand Prognosis Based on a Study at the North Quincy High
School, North Quincy, Massachusetts," (unpublished Master's thesis,
boston University, 1947), p. 12.
3. The Special Ability test proved to be best for selecting successes.

4. Failure can be predicted by the tests with over 85 per cent accuracy.

5. Successful stenographers can be selected.

This was the first indication that a battery of tests is more effective than single tests. He found that general intelligence was the most reliable single criterion for predicting success in shorthand. The results of his tests indicated that success in shorthand could be predicted to a high degree.

One of the areas of controversy found in the writer's study, the I. Q. rating, was discussed as early as 1923. McCall indicated that he felt that a score of 90 was average intelligence—the lower limit, to be sure—but at the same time a student with an I. Q. of 90 is of average intelligence.

In 1924, Chmann used the following criteria in predicting success in shorthand: spelling, language ability, personality rating, intelligence, vocabulary, and motility. He correlated these factors with scores from the Blackstone Stenographic Proficiency Test. The result was that the predictive value of the combined scores was little better than chance. The highest coefficient of correlation was .37 for both language and motility.


Ohmann concluded from his study that while his tests were not as yet entirely satisfactory, they seemed to hold some promise and would direct the way to the development of a satisfactory prognostic test.

In 1927, Limp administered a series of forty psychological group tests to high school freshmen after one week of instruction in shorthand and typing in the hope of selecting from this number of tests a battery which would predict the aptitudes and abilities of high school freshmen to learn stenography. The tests were taken from the Terman Group Test of Mental Ability, the Hoke Prognostic Test of Stenographic Ability, and the Downey-Will Temperament Test. The correlations between the tests and the shorthand criteria ranged from .06 for Coordination of Reaction to .53 for Recognition of Spelling. After obtaining correlations for the whole group of tests, which were conducted with 107 students, six tests were then chosen and investigated further. A correlation of .61 was found to exist between the criterion scores and predicted scores. Limp stated that "a student with a predicted grade of 70 or below is likely to make a low grade or fail in the course, while a student with a predicted grade of 90 or above will possibly pass with a high grade."

In 1928, Cooley conducted a study to determine the

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correlation between mental rating and vocabulary scores with shorthand and typewriting achievement. The Terman Group Test of Mental Ability, Form A, and the Stanford Revision of the Binet-Simon Vocabulary Test were given to ninety-six students of the Schenley High School in Pittsburgh, Pennsylvania, who were studying shorthand and typewriting. The results of these tests were correlated with grades made in shorthand and typewriting. The average of the three report grades for the semester were taken for the criterion of shorthand and typewriting achievement in making correlations. The following correlations were obtained:

- Shorthand correlated with I. Q. score 0.22
- Shorthand correlated with vocabulary score 0.32
- Shorthand correlated with typewriting 0.45
- I. Q. correlated with vocabulary score 0.66

Cooley found an interesting result: The girl with a 119 I. Q., which was the highest, failed in shorthand. The median of the I. Q.'s was 99, with a range from 81 to 119.

Mulvanny, commenting on the Cooley study, stated the following:

These correlations would seem to indicate that intelligence and vocabulary tests are of no practical value for predicting ability to learn shorthand; that intelligence and vocabulary tests measure similar factors; and that these are not the same factors as those measured in acquiring efficiency in shorthand and typewriting. The achievements shown by individuals revealed that outside interests, habits of study, and physical conditions greatly influence progress in shorthand and typing.

Fifty first-semester students in a Pennsylvania High

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School were used by Murray for a shorthand prognostic study during the 1928-1929 school year. The purpose of his study was to determine the relative ease in learning shorthand for students with high or low I. Q. The grades of these students from the first six lessons in Gregg Shorthand and the I. Q. ratings obtained from the Terman Intelligence Test were used as the basis for his comparison.

The results were as follows:

1. Of the 50 students, eight were failing and seven were on the border line of failure. Of these fifteen, two had high intelligence quotients, nine had medium intelligence quotients, and only four had low intelligence quotients.

2. Of the sixteen pupils who had high grades (above 90), two had very low intelligence quotients, seven were of medium intelligence and seven had high intelligence quotients.

3. Of the 50 students, sixteen per cent had low intelligence quotients, but 30 per cent of all the students made low or failing grades.

4. Twenty-four per cent had medium intelligence quotients, and thirty-two per cent made high grades.

5. Sixty per cent had medium intelligence quotients, but only 38 per cent were classed as medium students in the shorthand class.

The average grade was correlated with the average I. Q. by the Pearson Product Moment Method. A correlation of .46 was found between grades and I. Q.'s. The results of this study seemed to indicate that low intelligence quotients do not always produce low scores as only four low I. Q.'s were found in the fifteen failing or borderline students. This study also showed the possibility of low I. Q. students to achieve high grades.

Summary of Prognosis in Shorthand
from 1914 to 1930

This summary included the years from 1914 to 1930 in that limited activity was reported during this time. It was during this period that prognostic testing in shorthand began.

Rogers administered ten psychological tests measuring the speed of mental functions or processes to forty-five students of shorthand and typewriting. The highest correlation of .53 was found between all the tests and the grammar criterion. His conclusion was that even though the correlations were low this method was the best measure at that time attained for use in guidance in the field of stenography and that further research might develop a more predictive device.

Bills also conducted one of the first tests in this period. It was also conducted for the purpose of predicting success in stenographic courses. His conclusions showed a battery of tests to be more effective than a single test; of the single tests, general intelligence tests were the best predictor of failures. The best test for predicting success was the Special Ability Test. He also indicated that eighty-five per cent of the failures could be predicted.

Omnann determined that the highest coefficient correlation of .37 was found for both language and motility. He also concluded, as did Roger, that although his tests were not satisfactory, they showed some promise and opened the way to a better prognostic test.

Limp was next to administer psychological tests. He administered a series of forty psychological group tests to high
school freshmen to attempt to obtain a battery of tests for use in predicting aptitudes and abilities of high school freshmen to learn stenography. He then chose six tests as a battery for further investigation. A correlation of .61 was found between the criterion scores and predicted scores.

At the close of this era, Cooley conducted a study to determine the correlation existing between mental ratings and vocabulary scores, and shorthand and typewriting achievement. The correlations found indicated that intelligence and vocabulary tests would not be of value for predicting ability to learn shorthand.

Murray used 50 first-semester students in a Pennsylvania high school for a prognostic study to determine the relative ease in learning shorthand for students with a high or low I. Q. Grades from the first six lessons in Gregg shorthand and I. Q. ratings from the Terman Intelligence Test were used as the basis of his comparison. A correlation of .46 was found between grades and the I. Q. The results seemed to indicate that low intelligence quotients do not always produce low scores and also showed the possibility of students with a low I. Q. to achieve high grades.

Thus this era closed with no effective means of predicting success in shorthand; however, researchers were optimistic and felt their tests had been a beginning toward developing an effective means of predicting success in shorthand.
Prognosis in Shorthand from 1930 to 1940

As the new decade began, Munford expressed his opinion on the causes of failures in shorthand. Munford stated that a lack of English aptitude and not manual dexterity caused students to fail. Reference was made to the fact that all teachers are familiar with the student who reads and writes the simpler shorthand characters with apparent ease but when more difficult material appears he looks up from his notes not understanding what he is writing. He then inserts words familiar to him and therefore is unsuccessful in transcription. Munford stated it this way:

Every teacher is familiar with the student who learns and writes readily the simpler shorthand characters and who reads his notes glibly and superficially, with little or no conception of the thought the dictator seeks to express; the student who ceases writing and looks up inquiringly whenever an unfamiliar word is dictated, because of his utter inability to write words not already to be found in his English vocabulary; the student who restores literally what he understands by the notes in the shorthand notebook and who can be depended upon to ruin hopelessly any transcription work he undertakes. His difficulty is not one of manual dexterity. He thinks and responds quickly but his knowledge of the other tongue is so inadequate and superficial as to nullify the skill phases of his shorthand and typewriting work.

Munford further states that shorthand is not like an ordinary subject. It is a whole new language to be learned.

In an important sense, the student is learning a new language. If it is to be effectively mastered, if his study is to bring pleasure and inspiration, if he is to make satisfactory progress, there must be an intelligent command of the mother tongue. Without this knowledge and an ever-increasing desire to extend and expand it, the study of the new language will be a heavy task without much satisfaction or pleasure.

The following year Worley raised the question concerning the importance of English in learning shorthand: "Since so many shorthand courses make English a prerequisite of shorthand—is there any correlation between learning the two subjects?" In an attempt to find the answer, he conducted a study of 535 pupils at Langley High School in Pittsburgh. He concluded that the evidence indicated the same thing is not measured by intelligence tests and subject matter tests as is measured by school shorthand tests. He indicated that any school marks used, such as marks in science and mathematics, are as valuable in predicting shorthand success as marks in senior high school English.

A further conclusion was that the use of the I. Q. contributes very little to the reliability of an estimate of probable shorthand marks. He found that marks in modern language have seven times the weight of the I. Q. rating, and approximately twice the value of marks in junior high school English. When speaking of modern languages he included French, Spanish, and German.

In the year 1932, an attempt was made to find out to what extent standard instruments could be used for predicting success in stenographic abilities. An investigation was conducted in the Packard School of New York City. The investigation was conducted by Whitley. The investigator attempted to determine the extent to which standard instruments could be used in predicting success of

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students enrolled in the secretarial course. The length of time needed to complete the course in shorthand was used as the criterion of success and was also taken as a quantity performance index of the students. Whitley concluded that in his estimation the Hoke Prognostic Test of Stenographic Ability was the most adequate single instrument for prediction.

In 1933, manual dexterity again appeared as an important factor in achievement. Nichols stated, "Stenographers must possess the necessary manual dexterity to write very rapidly."

Another method used in the prediction of success in shorthand was to administer a short tryout course in the subject in the belief that what a student would do in this period of time would be indicative of what he could do for the remainder of the course. In 1935, Turse expressed his views on this subject when he indicated he was of the opinion that an exploratory course would probably be concerned with the study of shorthand principles and therefore, would not be an indication of how the student would fare in advanced shorthand or transcription. He indicated that characteristics such as manual dexterity, word sense, good vocabulary, and a good mastery of sentence structure probably would not receive sufficient attention in a short tryout course.


In 1937, Callanan described a study in which she conducted a series of tests in prognosis in shorthand. She used the Terman Test of Mental Ability, the Hoke Prognostic Test of Stenographic Ability, and the Tressler Test in English. These tests were used in conjunction with sophomore marks in English and typewriting. She was able to eliminate those most likely to fail in shorthand. After completing this test she then tested girls in the senior shorthand class to establish a criterion. This criterion would include typewriting speed, typewriting accuracy, five-minute solid matter dictation, re-dictation and transcription speed, spelling and punctuation. This criterion was compared with the actual marks given in shorthand and with the estimated success in stenography as given by the senior shorthand teacher. She then established correlations between this criterion and each separate part of the Terman and Hoke Tests and the complete Tressler test. She then selected a battery of tests that disclosed the highest correlation. This battery indicated a correlation of .772.

In this year, two different opinions were voiced as to what is necessary for the mastery of shorthand. Williamson said, "It is apparent that a high level of capacity to learn symbols is required for shorthand." Whalen agreed with Munford that the mastery of

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shorthand requires a strong English background which should include extensive vocabulary, English sense, ability to construct sentences, and the ability to punctuate properly.

One frequently mentioned study was conducted by Eyster in 1938. It included many of the factors referred to previously in various other studies as well as additional factors. It was started in the 1927-1928 school term and was concluded in the 1938-1939 school term. Eyster made this study because so many students were failing this course and because of the difficulty encountered by a large number of shorthand students in securing employment. To reduce shorthand enrollment he attempted to devise a method of predicting success in shorthand. He worked out the following factors of prognosis:

1. Mental rating.

2. Average English grade during the time the pupil had been in high school.

3. The average of all other grades, exclusive of English, during the time the pupil had been in high school.

4. Score on the Eoke Prognostic Test of Stenographic Ability.

5. Subjective personal traits as rated by business teachers, including:
   a. Composite average on work-habit traits—accuracy and neatness, initiative, and self-confidence;
   b. Composite average on character traits—honesty, responsibility, dependability, trustworthiness, interest, and industry; and
   c. Composite average on personality traits—courteousness and refinement, tact and graciousness, pleasantness and cheerfulness, appearance and grooming.

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The trait ratings were the average subjective ratings as given by each of the pupil's classroom teachers. Eyster did not make any claim as to the scientific accuracy of the procedure employed in using the five factors for prognosis of a student's success in shorthand. He attempted to reduce the five-factor scores to a composite measure but his attempts were not successful.

No claim is being made as to the scientific accuracy of the procedure employed in using the five factors for prognosis of a pupil's probable success in shorthand. The five factors are considered singly and collectively as indices of the pupil's ability. Attempts to reduce the five factor scores to a composite measure have not been successful. Each pupil is considered an individual case.

From the results of his test, Eyster concluded that the prognosis seemed to apply to other high school subjects with about the same degree of accuracy that it does to shorthand. He based this statement on a related study of the comparison of the prognosis of shorthand success with the pupil's achievement in high school subjects other than shorthand. He stated that this would indicate the factors used in the prognosis are measures of general scholastic ability and that they are not necessarily measures of special aptitudes for shorthand.

Toothaker in reviewing this study pointed out that Eyster's subjective method of shorthand prognosis had proved satisfactory at Fort Wayne, Indiana, where Eyster conducted the study.

Toothaker presents the following data:

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The students were separated into three groups according to the different rating: Group I included students who were "approved" for shorthand, Group II included students who had a "fifty-fifty chance of passing", and Group III included students who were "advised not to take shorthand."

In Group I, out of 370 enrolled, 2.4 per cent failed.
In Group II, out of 138 students enrolled, 49.2 per cent failed.
In Group III, out of 109 students enrolled, 100 per cent failed.

Toothaker believed that these figures indicated that the subjective method of counseling will eliminate the failures with some degree of success; however, there is no evidence that the degree of success can be predicted in Group I.
Summary of Prognosis in Shorthand from 1930 to 1940

The development of prognosis commenced with Munford when he stated the lack of English background, and not manual dexterity, was the cause of shorthand failure. The responsibility was, therefore, placed on the lack of a command of the English language. Nichols, however, maintained that manual dexterity was necessary to write shorthand rapidly.

Worley conducted a study to determine if there was a correlation between English and shorthand. He concluded that any school marks were as valuable as the marks received in high school English. He also concluded that I.Q. contributes very little to the reliability of an estimate of probable shorthand marks. In fact, he found that marks in modern languages had seven times the weight of the I.Q. rating and approximately two times the weight of marks in junior high school English.

Mulvanny sought to determine to what extent standard instruments could be utilized in the prediction of success in shorthand. He concluded that the Hoke Prognostic Test of Stenographic Ability appeared to be the most adequate and reliable single instrument for the prediction of success in shorthand.

Turse indicated a belief that exploratory courses would not predict the success of a student in advanced shorthand or transcription because a course of this type would more likely be concerned with the study of shorthand theory and principles. Manual dexterity, word sense, vocabulary, and mastery of sentence structure could not be measured in a short interval.
Callanan conducted a test designed to predict success in shorthand. Through the use of this test she was able to eliminate those most likely to fail in shorthand by using the Terman Group Test of Mental Ability and the Tressler Test in English, combined with sophomore marks in English and typewriting. She proceeded to conduct a test for seniors in the shorthand class to establish a criterion which would include typewriting speed, typewriting accuracy, five-minute solid matter dictation, redication and transcription speed, and spelling and punctuation. These results were compared with the actual marks achieved by these students in shorthand, and with the estimated success in stenography as given by the senior shorthand teacher. The test yielded a correlation of .772.

The last study selected during this decade was conducted by Eyster who attempted to combat shorthand failures by limiting shorthand class enrollments. He concluded from his study that prognosis applied to other high school subjects with approximately the same degree of accuracy as to shorthand.
Prognosis in Shorthand From 1940 to 1950

As the 1940-1950 decade began, many attempts but very little progress had been made in prognosis. Malveg and Snyder described the situation as follows:

Several years of contrasting the eager hopeful faces of students beginning the study of shorthand who anticipate successful secretarial courses with the discouraged, unhappy people who finally retire from the struggle of mastering the mysterious subject have made us realize the drastic need for diagnostic criteria.

As a result of her analysis of the literature pertaining to shorthand prognosis in 1941, Toothaker arrived at several conclusions relating to factors considered in predicting shorthand success. Additional research was necessary before a minimum I. Q. could be established. Students below this minimum would not be permitted to enroll in shorthand. Prevailing literature also indicated that manual dexterity would possibly indicate the highest correlation with the third and fourth semesters of shorthand. English grades, mentioned often as a prerequisite to success in shorthand, have a positive correlation. However, studies have indicated that all grades received tend to have a high correlation. A high correlation was recognized between language aptitude and shorthand aptitude. Further research on prognostic tests was considered necessary before they could be relied upon as a single factor in determining success in shorthand. The following is

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Although it is generally thought that intelligence ratings indicate a student's ability to learn shorthand, sufficient evidence has not been presented to substantiate the belief. Further research is needed to establish the lowest I. Q. a student may possess to be permitted to enroll for shorthand.

It may be that every individual possesses sufficient manual dexterity to complete the first year of shorthand; but manual dexterity might correlate higher with the third or fourth semester of shorthand work.

English ability often is made a prerequisite to shorthand enrollment, but the evidence is that spelling tests, vocabulary tests, and word meaning tests correlate from -.05 to .41 with shorthand achievement. While English grades do have a relatively high correlation with shorthand grades, studies pertaining to school marks indicate that all grades tend to have a high correlation.

There is general agreement on the fact that shorthand is a language art, and that language aptitude and shorthand aptitude must possess some of the same specific qualities.

The Hoke Prognostic Test of Stenographic Ability is not sufficiently valid to be used for reliable prediction, although it is the best known and most used shorthand prognostic test.

The Turse Shorthand Aptitude Test is a new test, and according to its author, has a high coefficient of reliability and validity. This, of course, needs to be substantiated by further research.

Research continued with Sherman conducting a test in 1942, using the following criteria for shorthand prognosis:

1. English achievement
2. General grade point average
3. Intelligence Quotient
4. Penmanship quality
5. Penmanship speed
6. Reading comprehension
7. Reading arts
8. Speed of motor action

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9. Spelling

10. Typewriting

Sherman stated his opinion on teacher given grades: "It is well understood from the beginning that teacher-given grades at best are not consistent, and therefore, cannot be assured to be an accurate evaluation of student success or failure."

He commented that "as his study progressed and the correlations appeared, it was discovered that the actual predictive value of the factors was valuable only to a minor degree." He further commented that "apparently in view of this study and other studies made, the factors of significance for prognosis have not yet been discovered."

Sherman attempted to explain the reason for the low correlation of the I. Q.:

The low correlation between I. Q. and shorthand is one of never-ending interest. It is probably due to the coincidence that students with a high rating in a mental test frequently do low-grade shorthand work, and low-rated students often receive some of the better grades in shorthand.

He further explained that possibly there is a connection between motive and low I. Q.:

The writer refers to the factor of motive or internal drive. This factor, in some measure, may be the answer to the low correlation between I. Q. and shorthand success. The failing student of high native ability undoubtedly tends toward failure in shorthand through sheer boredom, lack of interest, or lack of reason for taking shorthand, while the extremely low-ability student gives up because the goal seems too difficult.

Sherman believed that drive, desire, and need determine to a high degree the success a student will have in shorthand. If the degree of drive could be measured, it could possibly reveal the
answer to further prognosis in shorthand.

He concluded his article noting that prognosis depends on a variety of factors:

The whole field of prognosis depends to a great extent upon the varying degrees of teacher-given grades, tests, and measurements, which are not conclusive in the results or certain of the things they purport to measure.

Sherman stated as his belief: "The best we can hope for is an indication of success."

Turse decided to review the research studies that had been completed prior to 1942. He came to the conclusion that two of the most obvious and necessary abilities, "phonetics" and "word sense", had not been explored to the fullest extent.

Although at least fifty distinct abilities or capabilities have been investigated for shorthand predictive qualities, it is a curious fact that phonetics and "word sense"—two of the most obviously necessary abilities for shorthand learning—have been practically unexplored. On the other hand, some experimental efforts seem to be concerned with measures like general intelligence and English marks which are fairly definitely known not to have high predictive value for shorthand learning.

Turse was of the opinion that too much emphasis had been placed on general intelligence and English marks without justification. The same was true when he referred to correlations: "It should be obvious that achievement scores, however reliable and valid, do not always reflect pupils' capacities."

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Sherman agreed with Turse in expressing his opinion that up to this time there had been a great deal done in prognosis but a great deal remained to be done. The ultimate goal had not been achieved. Many variables such as the teacher, student's purpose in taking the course, and the school and its facilities enter the picture. Sherman implied that, conservatively, 35 per cent of shorthand beginners fail. When speaking of the first semester some studies indicate as many as 50 per cent fail. He believed that the correlation of the I. Q. and shorthand is low and overestimated as a determining factor. More frequently than not, high I. Q.'s will not achieve success in shorthand. Possibly this can be attributed to boredom. Sherman states that "average and slightly below averages seem to show the greatest per cent of successes in shorthand."

Sherman's suggestion was that a study be made of the successes and failures which have already occurred to determine goals, background, and objectives of the successful student.

Two years after reporting his research article, Turse expressed his views on the status of prognostic research studies in 1943. He did not give up hope for the future though many possibilities had been explored and a definite answer had not been discovered. A number of factors had not been considered. One of


these factors was phonetics. On a test conducted by Turse, a correlation of .57 was obtained between a phonetic association administered at the beginning of the shorthand course and scores achieved on a transcription test administered at the end of two years of shorthand. "Word sense" also indicated a correlation.

"Word sense" is the ability to construct words from a few known letters or syllables in contextual matters. In the same experiment, a correlation of .57 was found between scores of a word sense test and scores on a transcription test administered two years later.

Turse indicated visual factors also enter in the ability or inability to make the fine visual discriminations in proportion, slant, or position.

Turse referred to a fairly authoritative study of transcription errors made by Wood. This study indicated that 16.1 percent of all such errors were caused by faulty proofreading of notes and typing. Turse raised the question: "Does this not suggest that proofreading ability might be investigated as a potential source for shorthand prediction?" He went on to report that Cook and Appel obtained a correlation of .44 between proofreading ability and typing success. Since typing is usually a part of transcribing skill, Turse believed that the probability of significant correlation of proofreading with transcription should be highly considered.

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Turso spoke of audio-motor-memory factors. This could possibly be a correlation of value.

The Hoke Prognostic Test of Stenographic Ability makes an attempt to measure pure memory span under conditions whereby the testee reproduces matter from memory after it has been dictated. Might not the possibilities for prognosis be increased by the testing word carrying ability during the process of taking dictation? Such a triple-sense situation (audio-motor-memory) whereby the testee listens, writes, and carries matter in mind—all simultaneously—is more like the actual shorthand writing situation. Under such conditions, other factors equal, the pupil with a long memory span and low writing speed may get as much of the dictation as a pupil with a correspondingly short memory span and high writing speed. It would seem better, therefore, to inject these compensating factors in the test situation rather than to isolate them as in the case of a simple motor reaction test and a simple unrelated memory test.

Turso believed in the worth of investigating the relative importance of shorthand recording skill and shorthand transcription skill as a correlation factor.

Why did these studies fail to achieve their goal? Turso reviewed thirty of the studies conducted in shorthand prognosis and concluded that reliability was questionable because of the insufficient number of cases used in the various prognostic experiments. He warns that we must view the results with caution:

...eleven, or more than one-third of this number (30) were finally concerned with less than one hundred cases for experimentation. As far as could be determined, only five or six of the 30 studies involved the use of achievement tests at the end of two years. Ten of the thirty were M.A. theses, one a Ph.D. dissertation, and the others, direct or indirect reports or abstracts appearing in various educational and research journals. These studies probably are typical of the experimental effort to date in this field, yet some of the reports were based upon as low as 39, 55, 73, 95, 75, 40, 50, 50, and 96 cases. Certainly, any conclusions drawn from the results of such studies must be regarded with extreme caution.
In 1944, Dame, Brinkman, and Weaver explained that if the secondary school took as part of its function the guidance of students into useful life activities, it must do something concrete rather than just discuss these activities. They believed that such guidance might be accomplished by exploratory courses.

Such guidance might very well take the form of exploratory courses, the subject matter of which will also function in the social and economic life of the individual. Exploratory courses are constantly referred to in educational literature. Probably one reason for this is that it is necessary to challenge rather continuously the validity and reliability of prognostic testing.

According to these authors, prognostic tests should not be the sole basis for judging the possible future success of a student in the business curriculum. They indicated that other factors must be considered with prognostic tests. Some of these factors to be evaluated, either with or without using an exploratory period, are:

1. English grade
2. Intelligence Quotient or I.Q.
3. Personality Quotient or P.Q.
4. Foreign language grades
5. General scholastic rating
6. Reading ability score

When explaining what should be considered in these factors, these authors suggested that the English grade could be based on the general rating of the student in all English marks.

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If this system were used, a "C" grade should be considered the minimum requirement. The authors further noted that composition was judged by some to be the more effective way of determining the ability of a student to use all the essential rudiments of grammatical construction. They were of the opinion that English is important.

The English mark is important and is most frequently used as a determinant to success in shorthand. There is a definite correlation between English ability and shorthand success, but efficient tests to reveal this correlation have not yet been developed.

Next under consideration by Dame, Brinkman, and Weaver was the I. Q. This factor could be properly used in a limited way but too often it was used as the sole determining factor:

Intelligence quotients are too often employed as the sole factor for predicting possible adjustment in almost any curricula. Quite often it is used as a grounds for recommending continuance or discontinuance in commercial work. Certainly using the I. Q. as the sole measure is not a valid practice, but this item does have some just bearing upon the teacher's judgment of pupil adjustment and should be used in a limited way. It has been the usual practice to set 90 as the minimum I. Q. score for people taking commercial work, because it has been found that students possessing one below this mark seldom achieve success.

The authors quoted Perry¹ as saying that "No girl with an I. Q. of 90 has ever succeeded in completing the commercial course at the Allen High School of Commerce."

The authors also cited Fox² who declared that I. Q. and


English are sometimes used together. He issues a word of caution that these cannot be used as the sole factors:

Some schools use the I.Q. plus the English grade as the only two factors for judgment. More evidence should be used. Should there be a marked disparity between the I.Q. and the English score or general scholastic rating, it would be wise to administer another mental ability test. Some research studies show that the correlation between shorthand ability as revealed by tests and I.Q. is so low as to be of questionable value.

The next factor discussed was that of personality. The authors believed that this factor was difficult to evaluate:

Personality is a difficult thing to measure or to evaluate. For the most part, when a student's personality traits are discussed as a factor for recommendation, considerable objectivity creeps into judgment no matter how hard a group makes an effort to remain unbiased.

Personality is a difficult quality to measure because personal reflections on the part of teachers always appear to make their presence known. If possible, it would be better to use an evaluation device that would be more fair.

Kaiser stated his opinion on the personality factor and refers the reader to a rating scale he considered valuable for evaluation of this factor:

Since, so far as I know, no acceptable and valid objective method of rating personality has yet been devised, there is no basis for further discussion of this factor; but I would refer the reader to the Jones Personality rating scale, published by the Gregg Publishing Company. This scale attempts to arrive at an objective evaluation of a pupil's personality by pooling the opinions and impressions of three or more teachers who are in direct contact with the student.

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Fox included foreign language grades as a measure that could be used where applicable. He did qualify this measure somewhat when he stated that business education students cannot always be measured by this method because they frequently do not have the opportunity to take language courses.

The foreign language grades made by the student may be used as a predictive measure if he has taken a language. Business students do not usually go into this field because of the time element in their crowded schedules. Occasionally there is an opportunity for a student to take two years of a foreign language in lieu of some required business course if a subject of this kind is earnestly requested for a particular purpose. Usually the equivalent of a "C" is prescribed as a minimum for success in shorthand, since there appears to be a definite correlation between shorthand success and language ability.

The use of the student's general scholastic record was suggested for the purpose of getting a look at the student's background in work habits. This was suggested because good work habits and good attitudes are essential in the business world and if a student does not show these, perhaps it would be better not to encourage or assist his entrance into business courses.

Of real value, according to Dames, Brinkman, and Weaver is the reading ability score in planning predictive programs.

The result of such a test used in a supplementary capacity, coupled with a diagnostic English test, reveals the student's comprehension and will give an adequate indication of the student's language ability.

The last two factors included in the list were student absences, which were believed to be a predictive measure; the mental ability test, which was the other factor of importance.

As the halfway mark in this decade passed, Osborne was in agreement with Dane, Brinkman, and Weaver when speaking of the role of intelligence in prognosis when she stated that, "At present, the inefficiency of intelligence tests as a single factor in predicting shorthand success is quite widely accepted by educators." She also commented on using teacher's marks as a factor in prediction and voices a word of caution:

Even though relatively high correlations have been reported between shorthand achievement and teacher ratings in English, penmanship, typewriting, foreign language, etc., caution must be observed in recommending school marks for use in prediction of shorthand ability. School marks are often influenced by factors that are extraneous to learning.

Several of the factors previously discussed were used in a test conducted by Ripley in 1945. Ripley attempted to determine the relationship of I. Q.'s, teachers' marks, and Student Power Inventory test scores of business students. The actual problem of this study was to determine the intellectual ratings of business students enrolled in several high schools during the second semester of 1942-43, and to determine the relationship of their mental ability to their achievement in business and nonbusiness subjects. Student's permanent record cards and the Student Power Inventory sheets were used to obtain all the information for this study.

A summary of the pertinent findings in this study, as taken from her abstract, were as follows:

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A review of related studies showed that when business students were compared with the nonbusiness students, they compared favorably, both as to native ability and achievement. These studies revealed, also, that when the relationship between the I. Q.'s and achievement was determined by statistical methods, the coefficients of correlation were less than 0.70, and most of them were between approximately 0.40 and 0.50. When the relationship was determined by I. Q. groupings, a direct relationship was shown where most of the high marks were earned by students with high I. Q.'s and most of the low marks were earned by students with low I. Q.'s.

It was shown in several of the studies that the I. Q. was of more value as an indication of the mental ability of a group of students than of the mental ability of the individual student.

The main part of the study shows that of the total number of business students enrolled in five high schools, second semester, 1942-43, 22.0 per cent were boys and 78.0 per cent were girls. I. Q. scores were available for 84.7 per cent, or 1,008 students. The median I. Q. for all business students was 103.5; the median I. Q. for girls was 103.4, and for boys, 104.5. The median I. Q. for students in typing was 102.9, in shorthand, 104.3, and bookkeeping, 105.3.

The distribution of the I. Q. scores, both as a group and in the different business subjects, closely resembled the curve of a normal distribution. There were 89.9 per cent with an I. Q. of 90 or above and 63.5 per cent with an I. Q. of 100 or above.

In both four- and five-letter grading, there was a direct relationship between the I. Q.'s and teachers' marks. The per cent of high grades decreased and the per cent of average and low grades increased as the I. Q. decreased. The greatest number of high grades was earned by students with high I. Q.'s and the greatest number of low grades was earned by students with low I. Q.'s.

It was indicated in this study that Ripley found the I. Q. to be substantially in agreement with teacher-given marks and found the I. Q. to be equally predictive of success or failure in business subjects.

Anderson developed a very comprehensive study analyzing and classifying research in shorthand and transcription. One section

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of her dissertation was devoted to prognosis in shorthand. She reviewed forty-four of the studies in this field. She noted that "there is no general agreement among business educators as to the desirability to limiting enrollment in shorthand on the basis of ability or aptitude." This lack of agreement may be largely due to the fact that reliable predictive measures are not available. There is little agreement as to the best means of predicting achievement in shorthand.

She reviewed some of the elements that had been used for predicting achievement:

Among the factors that have been studied to determine their usefulness in predicting are phonetic ability, speed of writing, speed of reading, quality reading comprehension, memory, languages, and scholastic achievement. Both mental and motor skills have been tested in an attempt to discover factors which would yield high correlations with achievement in shorthand. The investigators of the problem of prediction of achievement in shorthand have had only limited success.

She found a difference of opinion as to whether success in beginning shorthand would indicate success in advanced shorthand:

Some researchers have concluded that success in beginning shorthand is indicative of success in advanced shorthand. Other investigators have found that the factors involved in mastering shorthand theory and developing dictation and transcription skill are almost unrelated. The latter group content that a pupil may have thoroughly mastered the rules and principles of shorthand theory and not be able to use the knowledge in transcription.

Anderson emphasized that there is little agreement but concluded that some factors were found to be of more value than others:

... definite conclusions are inadvisable, but the reports seem to indicate that a number of investigators have found English marks, scholastic achievement and foreign language marks to be
among the best measures yet selected to predict success or failure in shorthand.

Anderson also came to the conclusion that more research was needed especially in cases where isolated factors had been used.

Analysis of the foregoing findings shows that a large number of studies have been made in which the relationship of isolated factors such as intelligence and English ability to shorthand achievement was determined. Investigations in which a combination of factors are studied may yield much more valuable findings than studies of single factors.

Factors that could show prediction that have not been studied sufficiently are the following as listed by Anderson:

- In only one study has extensive use been made of trait rating scales. Further investigators might consider the possibility of further study of the value of trait rating scales in prognosis.
- Another predictive factor which might be considered is personality. In only two studies was this factor considered and the findings reported were in disagreement.
- There is some indication that marks in foreign languages and scholastic achievement are factors which might strengthen a prognostic battery.
- A need exists to determine definitely the extent to which success in beginning shorthand is indicative of success in advanced shorthand.

When reviewing the results of these studies she felt that there was too much disagreement—even in cases where the factors were the same. She thought perhaps this might be due to uncontrolled factors in these studies. She also stressed that more attention to the selection of criterion would be important in further studies.

The problems of shorthand prognosis, the reasons for failure of prognosis, and suggestions for improvement in prognosis were given
in 1945 by Leslie.¹

He stressed the uselessness of prognosis to date. He
first presented Osborn's² review of a bibliography of 58 items and
"presents as a result of her own original study, coefficients of
correlation of 30 variables, ranging from arithmetic to the iden-
tification of fruits."

He quotes her conclusion:

None of the correlations between the shorthand criterion and
single tests or between the criterion and combination of tests
is high enough to make prediction valuable except in the
negative sense.

He also remarked that Ruth Anderson's³ study showed prognosis
to be inaccurate in forty-four abstracts of studies. Also mentioned
was Blanchard's⁴ extensive study which he conducted with the
collaboration of 51 high schools and colleges in twenty states.
All the correlations were very low and some of them were negative.

Leslie listed the errors made in devising prognostic
tests. The shorthand prognostic test is usually given to tenth
graders and even though these students may not be brilliant, they

¹Louis A. Leslie, "Shorthand Prognosis," Business World,

²Ruth Irene Anderson, "An Analysis and Classification of
Research in Shorthand and Transcription," (unpublished Ph.D.

³Agnes E. Osborn, "The Relationship between Certain
Psychological Tests and Shorthand Achievement," (unpublished
Ph.D. dissertation, New York Teachers College, Columbia University,
1943), p. 53.

⁴Clyde I. Blanchard, "Results of a Study of the Validity
of the Hoke Prognostic Tests of Stenographic Ability," The American
have been intelligent enough to complete the first ten years in the educational system. Leslie was of the opinion that any pupil who had learned to read and write on a tenth year high school level had already given indisputable proof of his aptitude for learning shorthand:

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 or because he is not properly taught.

Leslie believed the second error in prognosis was that of basing correlations on school grades in shorthand or on administration of purely shorthand tests:

When school marks are used for purposes of establishing correlations, there is no certainty at all that identical tests are used; and, unless identical tests are used, the pupils are being measured with an elastic yardstick.

It is his belief that the only valid test is a predetermined transcription test in which there is a close control over the amount of material dictated, the difficulty of the material dictated, the percentage of mailability required, and lastly, the speed of the transcription required.

The third error he noted was that of ignoring the circumstances which surround the learning process. This, he felt, is a really important factor in shorthand achievement testing.

The fourth and last error mentioned was the disregard of the importance of the student's having had enough English background to be able to turn shorthand notes into a typewritten transcript that is acceptable.

In summary, Leslie stated: "... there are only two
factors included in the student's likelihood of learning shorthand (not transcription). One of these is his willingness and cooperation. The other is skill and enthusiasm. These two factors cannot be measured effectively.

Leslie wanted it understood that he was not in favor of a shorthand prognostic test. He did not think these tests were necessary or desirable. What he actually thought was that a prognostic test for transcription rather than for shorthand was needed.

He did not believe a prognostic test could predict success: "It is not possible to say definitely who will surely succeed; it is possible to say who will surely fail."

As the year 1948 approached, the writer found Sister M. Theresa. She agreed strongly with Leslie. She felt that everyone, including low-ability students, could master shorthand.

She believed we have a moral obligation to do our part in making a place in the world for all students whether they be bright or not so bright:

If we cannot train students of all abilities to take their places in the business world, our business education program is inadequate. We are committed to educate 'all the children of all the people.' We in business education have an even greater responsibility in that respect because it is our responsibility to see that the child is given a skill that will enable him to earn a living and preserve self-respect.

Sister Theresa wanted to find out if commercial seniors were really inferior to academic seniors. In 1940, she made a

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comparative study in ten Catholic high schools for girls in the state of Illinois. The results indicated that culturally, intellectually, and spiritually these two groups of students had much in common. When this article was published, it had been seven years since her study so to reassure herself and others she again investigated shorthand and typing results achieved by various I. Q. groups from 1945 to 1947 in the school in which she was teaching: Madonna High School, Aurora, Illinois. She reviewed it thus:

We had seventeen students in the commercial department who had I. Q.'s ranging between 79 and 94. Eight of the 17 failed or did not continue shorthand. Of the nine that completed the course, six received their 140 shorthand award from the "Gregg Writer"; one, her 160 word pin; and two just met the graduation requirement of 125 words per minute. But of the eight who took only one year of shorthand, three succeeded in writing 75 or more words a minute in typing; two, 70 or more words a minute; and three just made the course requirements of 65 or more words a minute. Two of these girls had an I. Q. of 91, one of the two wrote 81 words a minute on the typewriter and the other attained a typewriting speed of 88 words a minute.

Sister Therese found, therefore, that a low I. Q. does not necessarily mean the student will fail.

Sister Therese asked a thought-provoking question when summing up her study: "What would have happened to such students if we had told them they were not permitted to register for the business course?"

Teachers of shorthand are not the only people who must be concerned with the selection of students for shorthand and vocational business subjects. Hardaway¹ pointed this out in 1948 when

she brought certain pertinent facts to the attention of administrators. She felt that administrators should also have some knowledge pertaining to the selection of students. She states that they have a very real problem. When speaking of the predictive measures available at the time of her article, she stated:

The predictive measures that we now have available can be judged only in the light of the success measures that have been used to validate them. No two in the field have been validated against the same criterion, and consequently, their validators cannot be compared.

She continues to speak of factors used in tests:

No test should be used as the single factor in determining whether a student should be advised to take a business subject or any other subject in the curriculum. The results of a test should be teamed with other indicators of success.

She concluded the better of the available tests are useful in their place and she believed that place was "as one factor to be considered in the total guidance program."

In the year 1949, Cowan stated the problem in another way. Just too much time was being demanded of students trying to learn shorthand. He put it this way: "No subject in vocational training has ever used up so many man hours in being invented, taught, and learned as shorthand. Not only that but it has used up those hours to the exclusion of other good subjects."

In 1949, Anderson was again active on the scene concerning shorthand prognosis. This time the concern was with the value of

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teacher's marks in the use of prediction. She reviewed the study of Heil, who studied 225 graduates of a Louisville, Kentucky, high school who had successfully completed their training in stenography. They were from twelve classes covering the years from 1930 to 1935. Pupils' scholastic achievement records and scores on the Otis Intelligence Test were taken from the school files. Teachers' marks were used in English 2, English 3, composition 4, typing I, bookkeeping I and II, and Spanish I and II. These courses were selects for the study having been taken before teachers' shorthand marks were available.

The findings of this study showed that the average I. Q. was 104.44. This was higher than if those who had dropped had been included. Heil did not find the I. Q. a satisfactory index of pupil success in stenography. As shown in the teachers' marks for pupils with an I. Q. of 110, the I. Q. had a better predictive value than it had for all pupils combined. She noted in her study of the range of I. Q.'s of pupils who earned shorthand marks of E, C, D, and E, that little relationship existed between the I. Q. and the marks that were received in shorthand. She did find, however, that no pupil with a 90 I. Q. ever received an A. The marks in stenography and English showed a slightly higher correlation than those between I. Q. and stenography. They were not sufficiently high to use English marks as a single factor in the prediction of what a pupil would learn in shorthand. Marks in stenography and typewriting were also too low for predictive purposes. Teachers' marks in bookkeeping had the highest correlation.
Summary of Prognosis in Shorthand from 1940 to 1950

This decade opened with Kelvin and Snyder stressing the remaining needs prevalent in the field of shorthand prognosis.

Toothaker's study was selected to show the need for further prognosis. She made an analysis of the literature pertaining to shorthand success and found the following:

1. Further research was needed to establish the lowest I. Q. a student could have to be permitted to enroll in shorthand.

2. Manual dexterity might be possessed by first year shorthand students but the real test of this ability would probably correlate higher with the third and fourth semester of shorthand.

3. English grades correlated relatively high with shorthand grades but studies that pertained to school marks indicated all grades tend to have a high correlation.

4. There was general agreement that shorthand is a language art.

5. The Hoke Prognostic Test was not sufficiently valid to be used for reliable prediction and the Turse test had as yet to prove itself.

Sherman also attempted a further analysis of this problem. He used the following factors: Reading comprehension, reading rate, penmanship quality and speed, English achievement, spelling, typewriting, speed of motor action, intelligence quotient, and general grade point average.

He concluded that teacher-given grades are not consistent and cannot be relied on as an accurate evaluation. He felt, as his study progressed, that the actual predictive values of the various
factors were of a very minor value for prediction. He was of the opinion that motive or internal drive, which cannot be measured, might be the answer to further prognosis if a way to measure drive could be discovered.

Turse noted that "word sense" and phonetics, which have been practically unexplored, were two necessary abilities for learning shorthand. Turse expressed the opinion that general intelligence and English marks are of limited predictive value and have received too much emphasis. He also indicated that too much emphasis had been placed on correlation.

Sherman and Turse agreed that the correlations between I.Q. and shorthand success are low. Sherman pointed out that average and slightly below average students seemed to exhibit most success in shorthand. Both felt additional work should be done in prognosis. Turse expressed his views on the status of research studies two years later. Although not too much had been accomplished in prognosis, the future was not hopeless according to Turse. He again expressed his belief in "word sense" and phonetics because of the high correlations obtained in his own studies. He also raised the question as to whether faulty proofreading and audio-memory could be factors. Studies in this area had not accomplished what they had set out to accomplish because of the lack of sufficient numbers in conducting tests producing results that had to be viewed with caution because of an insufficient number of cases.

Exploratory courses were brought into the picture by Dame, Weaver, and Erinkman. These men were of the opinion that prognostic
tests alone could not be used as the sole basis for judgment of future success in shorthand. Some of the factors they considered were English grades, I. Q., personality quotient, foreign language grades, general scholastic rating, and reading ability scores.

Osborne was also of the opinion that single factors are inadequate. Intelligence tests alone would be an inefficient way of predicting success. Caution must also be observed when using teachers' marks as a single criteria. She believed, however, that individual differences in mental ability would be a prime factor in student achievement.

Ripley was of a different opinion when, as a result of her study, she found the I. Q. to be in agreement with teacher-given marks and the I. Q. to be quite predictive of success or failure in business subjects.

In her comprehensive study in which she classified and analyzed 44 studies pertaining to prognosis in shorthand, Anderson found conflicting opinions concerning the relation of success in beginning shorthand and success in advanced shorthand. She observed that researchers concluded that beginning shorthand was indicative of success in advanced shorthand and other researchers reached a contrary result.

She also reported that a number of investigators found English marks, scholastic achievement, and foreign language marks to be among the best measures yet selected to predict success or failure in shorthand. Anderson agreed with Sherman and Turse when she stated the need for investigation of a number of factors rather
than single factors. Factors suggested for further investigation were trait rating scales, personality, marks in foreign languages, scholastic achievement, and also the relationship or success in beginning shorthand as indicative of success in advanced shorthand.

Leslie listed some of the errors made in devising a test for prognosis. The first one listed was that of ignoring the fact of having a preselected group before we start testing the aptitude of students. If they were not intelligent enough to get through the tenth grade, they were not intelligent enough to learn shorthand. This would give indisputable proof of his aptitude for shorthand. The second error was that of basing correlations on school grades in shorthand or on administration of a purely shorthand test. The third error was that of ignoring the circumstances which surround the learning process. The fourth error was the disregard of the importance of having a sufficient English background to be able to turn shorthand notes into a typewritten transcript that is acceptable.

Leslie felt there were actually only two factors included in the student's likelihood of learning shorthand; one is his willingness and cooperativeness and the other is skill and enthusiasm. These factors cannot be measured effectively.

Sister Therese agreed strongly with Leslie. She was of the feeling that everyone, even low ability students, could master shorthand. She conducted two studies and found this to be true.

During this decade, it was again pointed out that tests should not be used as single indicators of success. Hardaway stated that these tests should be teamed with other indicators of success.
Toward the end of this decade, Anderson reviewed Hall's study which was concerned with the value of teachers' marks for use in the prediction of success in shorthand. Hall did not find the I. Q. to be a satisfactory index of pupil success in stenography. The range of I. Q.'s showed very little relationship to marks received in shorthand. She found that marks in stenography and English showed a slightly higher correlation than those between I. Q. and stenography.
Prognosis in Shorthand from 1950 to 1960

"Who should take shorthand?" This was the question asked in 1950 by Gallagher, Albert, and Stryker, as the last decade of this study was begun. A study in Bound Brook High School in New Jersey was concerned with the relationship of intelligence, typing, and ability in ninth grade English to success in shorthand, and with examining the sequences in English, typing, and shorthand to see what order of subjects might be expected to produce the best results in prognosis drawn from the records of graduates.

Shorthand I (first year shorthand) students had I. Q.'s that ranged from 78 to 120 with average being just above 100. Seventy-five per cent of the students with I. Q.'s under 100 achieved results that were below what could be expected to develop into a commercially useful skill. A study of Typewriting I grades of students in Stenography I (combination of Shorthand I and Typewriting I) showed that three-fourths of the Typewriting I students with typing grades under 30 did work in stenography that was not good enough for use in business later on. Only two out of fifteen Stenography I students with English grades that were under 80 developed skills in shorthand that were commercially useful. There were fewer Shorthand II (second year shorthand) students but there were still 27 out of 63 of these students who did work below the quality an employer had a right to expect.

Much of the poor work that was done in Shorthand II was associated with poor scholastic aptitude. About 70 per cent of the students in Shorthand II had I. Q.'s that were under 100. Only thirty per cent of these students with the I. Q.'s under 100 did acceptable work in Shorthand II. About 70 per cent of the poor students in Shorthand II also did poorly in Typewriting I grades. Only one student in ten in Stenography II (combination of Shorthand II and Typewriting II) who had grades under 80 in ninth grade English did good work in Shorthand II. When students had grades above 80 in ninth grade English, the chances of satisfactory grades in Shorthand II seemed to be about two out of three.

Correlation of the data seemed to indicate that typing is first as a supporting factor for success in shorthand; ninth grade English would rank second; and the I. Q. would rank third.

This study pointed out, that in view of the relative importance of typing in this study, typing should come before beginning shorthand. This would enable the student to get some idea of his skill in this subject before studying shorthand and it would also make it possible for Shorthand I students to use their acquired skills in typing transcription exercises.

In December of 1950, Poulter and Sullivan reported that "Interest is important, but a high level of specific ability is also needed . . ." They felt that the attitude in the United

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States toward prognostic testing was summed up well by Dame:¹

... This technique is not as yet well developed and, considered by itself, is not sufficient. The recently developed Kuder Preference Record provides help in localizing general areas of interest which some teachers are using. The Hoke and Turse tests have been used in connection with predicting success in shorthand, but, in general, the relationship between test scores and achievement have been too low to warrant full acceptance of them for this purpose.

In November 1950, Morgan² again brought the status of prognosis in Business Education up to date. Here again the question was asked: "What criteria are used for prognosis? Are they reliable?"

His first considerations were the I. Q. and school marks. Most people he felt would agree that these criteria have some value for prediction. The danger here is that a counselor might place too high a value on these criteria for prediction. He commented that students have shown I. Q.'s yielding co-efficient correlations of from .40 to .60 with teachers' marks. Most of the co-efficients congregated around .48. A correlation of .50 meant that results were about twenty per cent better than chance, and a .48 correlation was a little more than ten per cent better than chance.

He next discussed school marks which he felt were likely to reflect everything from dress and manners to deportment and truancy. For this reason he did not think marks were reliable as


devices for individual prediction. Researchers have shown over and over again the great variations that exist among teachers' marks. This does not mean they do not consider marks of some value but that they should be teamed with other criteria.

Enterline explained that research has not revealed that business courses require any special abilities which would not be needed for the same degree of success in other fields. Therefore, he feels general ability is as valuable in business education subjects as in other fields.

Morgan stated only those people with vocational stenographic possibilities should take shorthand. Morgan noted the criterion various researchers have attempted to correlate with shorthand. He first noted that Hardaway found the I. Q. was as closely related to shorthand success as it was to other academic subjects. The correlation was .45 which was not considered very high. Hardaway also noted that researchers indicated a modern language is the best predictor of shorthand capacities. The coefficient for modern language was .76. English marks are also high with a coefficient of .70. The English mark should be taken from a grammar course rather than from a literature course. If foreign language grades are not available, which is often the case for business students, prior grades in English or grammar along with the best

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prognostic test that is available would be the most desirable and reliable way to predict success in shorthand.

Morgan then reviewed Osborne's results. This study was previously mentioned. She correlated shorthand achievement with the Otis Self Administering Mental Test, the Iowa Silent Reading Test, the IER General Clerical Ability Test, the Minnesota Paper Form-Board test for spatial relationships, and the Gates Visual Perception Test. Morgan quotes Osborne's very definite conclusion: "There were no correlations high enough to make predictions except in the negative sense."

Brewington makes the following recommendations as to who should study shorthand. She recommended a "C" or better in the fundamentals of English and spelling, and she suggested a minimum I. Q. of 90. Brewington agreed with Osborne that superior intelligence does not assure high achievements and low intelligence does not mean high scores cannot be attained in shorthand.

The researchers felt the important thing was to get the student to use his native ability. Morgan reported that no writer on the subject of prognosis felt that only one criterion was necessary. Rather they all thought more than one should be used and many suggested as high as four or five.

Morgan summed up the factors that could be used for

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Following the suggestion of Hardaway, we could use English grades as one predictor. The I. Q. could be another. If we can locate some way to measure the intensity of the student's desire to become a stenographer, we can also use that measure. Where the school has a brief exploratory course, the grades of that course give us such a measure of interest. These four items, English grades, I. Q., aptitude test scores, and pupil interest—will give a battery of reasonably predictive value. As a last resort, the counselor can fall back upon grades in school and I. Q. for negative prediction.

Morgan had his own point of view on low-ability students. He thought these students should have the right to enroll in business education, but should be discouraged from entering vocational preparation fields. He stated:

... These students should be permitted to enroll but be discouraged from attempting the vocational preparation fields of shorthand and advanced bookkeeping. The student of low ability will not do any better in general academic subjects, especially those where considerable reading is necessary.

A study was made in 1952 by Jack. He tested 116 students at North Quincy, Massachusetts. The I. Q. ratings, as well as grades in English, were used. For a composite score he added grades on the Turse test to the I. Q. scores and English grades. The conclusion made after conducting the study agreed with other researchers in that no one factor or even a combination of factors could be used as an adequate basis for selecting students:

... the general conclusion that was reached after making this study was no, one factor nor any combination of factors tested for or used in these comparisons provided an adequate basis for prognosis in the study of first year shorthand.

Jack then decided to make a further study in second year.

stenography. He came to the conclusion that there was more correlation between the Turse Shorthand Test and the second year of shorthand. Also, he found the I. Q. to be of greater value for use in second year stenography. Mailable letters correlated very well with this test. English did not seem to have a significant correlation, Jack summarized the study in his conclusions:

1. There is a more significant degree of correlation between the results of the Turse Shorthand Aptitude Test and the second year of stenography.
2. That a degree of correlation between this test and second year stenography is far greater than that found between the same test and first year stenography.
3. There is a rather high degree of correlation between the I. Q.'s of the students taking second year stenography and the total scores attained on the Turse Aptitude Test.
4. There is a very high degree of correlation between the results of the Turse Shorthand Aptitude Test and the number of mailable letters the students turned out.
5. There is no significant correlation between the results of the Turse Shorthand Aptitude Test and twelfth grade English.
6. A composite score made up of the results of the Turse Aptitude Test, English grade, and I. Q.'s gives a significant coefficient of correlation.

Jack was of the opinion that the Turse Aptitude Test proved to be good enough to be granted further investigation. He stated:

"From the data collected and results obtained in the administration and analysis of the Turse Shorthand Aptitude Test, I feel that the test is worth further trial and investigation."

Costello believed improved guidance was necessary if we were ever going to prove ourselves worthy of not being considered the dumping ground for students. One way to combat this might be to acquaint our colleagues with the qualifications that an employee

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in business must have in addition to general motor skills. She was a staunch advocate of a selective program and believed that all should be allowed to take these courses for personal use. She states:

... that a selective process for admittance to this program should be a must in every high school and college. This does not mean what students should be restrained from taking typing—or even shorthand for their personal use. It means that the objectives and the approach for a personal-use group cannot and should not be the same as the objectives for students enrolled in the secretarial curriculum for vocational purposes.

We must also inform students of the various occupations that are available in business after they graduate. We have to be more selective and this should be through multiple criteria. She makes this point: "Vocationally speaking, shorthand is just a means to an end—transcription. If an applicant with a normal public school education cannot pass a simple vocabulary test, she will be of little value as a stenographer." Costello outlined a working plan that suggested what criteria could be used. She pointed out that since there is a definite correlation between intelligence and the ability to succeed in secretarial work, it would be advantageous to administer tests which would include the factors of mental ability, vocabulary, and English usage. She did feel, however, that this could not be used exclusively because of the advisability of using more than one criteria. She therefore added a rating scale and interviews to the tests in her working plan which consisted of the following:

1. Since there is a definite correlation between intelligence and the ability to succeed in secretarial work, it would be advantageous to administer tests of (a) mental ability,
(b) vocabulary, and (c) English usage.

Because of the desirability of using more than one criterion in any process of selection, it is advisable to use a rating scale that will show an over-all picture, to be kept in file after the important personal interview.

She mentioned the following information that could be included in the rating scale: the attendance record, physical condition, student purpose, previous school marks, English, and personality. It would not be possible to rate all these traits in one interview, but if they had ranked low in a majority of them, it would establish with reasonable certainty that that person should be redirected.

Miss Costello summarized by stating that we must have selection to have status, that it is our job to develop personal attributes in our students, and to give them a clear picture of the field they are entering so they will be satisfied in this field.

1. We must have selection if we are to have status.
2. Personal attributes are as important as motor skills and must be learned in the classroom, not on the job.
3. The glamorous aspect of the stenographic-secretarial area must be de-emphasized if we are to have satisfied graduates who will meet the needs of business.

In 1953 Duchand again questioned whether we can predict superior students in shorthand. He discussed the theories of the various teachers who believed some of their students should not be in their classes because of their lack of intelligence as this would limit their chances of being successful in shorthand. He stated that these teachers believe the major factors that determine the

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1Simon A. Duchand, "Can We Predict Superior Success in Shorthand?" Business Education World, XXXIII, (February, 1953), pp. 276-277, 303.
success of these students would be their intelligence quotient and their reading ability. These factors would be applied in including or excluding students from shorthand.

Duchand inquired as to whether this elimination is justified and expressed his own uncertainty. He tested these two factors and found that they did not predict superior achievement accurately. Duchand believed the direct method of measuring the efficiency of I. Q. and the reading scores is to look at the records of students who have already completed shorthand and see if there seems to be a high correlation between these two factors and shorthand prediction. He compared these factors by conducting a study of four groups of students. He found an insufficient correlation to justify reliance on these two factors. He tested two Gregg shorthand groups and two Pitman shorthand groups. He used the two types of shorthand to test shorthand in general rather than one specific type. The school in which he conducted the study had a program which included three years of shorthand. They could choose either Gregg or Pitman shorthand. At the end of the first semester, students could choose to continue shorthand training and become either "single or double" major students. The latter were those who showed better than average in their first term of shorthand and bookkeeping. He actually had four groups to study: The Gregg single major student, the Pitman single major student, the Gregg double major student, and the Pitman double major student.

Duchand analyzed the records of these four groups to compare their I. Q.'s and reading scores and their shorthand achievement
scores. He failed to establish definite trends or relationships between either of the two factors—I. Q. or reading scores. Nor could he establish a correlation between the combined I. Q. and reading scores and superior stenographic performance. He stated that this had been demonstrated many times in controlled experiments but the criterion of achievement had never been the grade achieved in actual class work on the fifth and sixth term levels. Duchard believed, from the results of his study, that it was obvious a concentrated effort to improve the reading ability of students would probably yield good returns. The one factor he felt was the most important was motivation. The drive for success on the part of both the student and the teacher would be a real determiner of success in shorthand. His feeling was that the fallacy of the I. Q. "is not how much intelligence a student possesses, but how much of it he actually uses. The same may be said of reading ability or any other factors that are believed to influence shorthand performance."

What inspires these students to make a sustained drive for success in shorthand is hard to determine. However, the inspired leadership and guidance of a teacher who is himself highly motivated seems to be one of the most important factors.

Guidance "must be a continuous everyday thing." This was learned from Mahaffey¹ in 1953. He indicated that guidance should be taken care of by one person who is prepared to administer

guidance needs. The business teacher should play an important role in guidance. He should guide students into occupations that will give the individual the greatest satisfaction and make him most useful.

When speaking in relation to guidance of students in business education, Linnane reviewed a study he conducted in a high school in Cranston, Rhode Island. He, too, felt it was necessary to screen the students in terms of abilities, aptitudes, and interests. He thought this was necessary because of the number of complaints received from businessmen stating that graduates are turned out lacking the fundamental skills. They are also lacking in initiative, ambition, responsibility, and personality. After screening the students, those that do not come up to par should be guided into other subjects that are suited to their abilities and aptitudes. The criteria generally adopted for this purpose have been results of intelligence tests, academic record, use of exploratory courses, and prognostic testing.

Linnane felt the tools important to stenography were a command of the English language and good handwriting. There was also use for aptitude tests as he stated: "Stenographic aptitude tests may be used to test the student on grammar, spelling, sentence structure, etc."

Linnane reached definite conclusions as a result of his study and they were as follows:

1. We cannot allow business courses to become a dumping ground.
2. Students must be selected and placed in classes that fit their needs by giving more attention to prognostic testing and counseling in terms of the student's abilities.
3. Testing should be regarded as a contributing factor in assisting students and not a controlling guide.
4. Reasonably high standards must be maintained in consideration of the future employer; and
5. Placement and follow-up are an essential service.

As the midpoint in this decade was reached, exploration of prognostic testing in shorthand continued. Missling conducted a study which was reviewed in 1955. Once again the purpose of this study was to ascertain if prognostic tests were an effective method to use in predicting success in shorthand and to determine which factors had the greatest influence on shorthand. She made the following statement:

Purposes: to help determine if prognostic tests were an effective method to use in predicting success in shorthand and to find out which factors, typewriting grades, English grades, high school grades, excluding English and aptitude tests, had the greatest bearing on shorthand and to advise those students whose chances of success are limited to enroll in other courses.

The Turse Shorthand Aptitude Test was given to all the students interested in enrolling in beginning shorthand. This was for the school year of 1952-1953. The test was used for the purpose of guiding students into other courses if the score showed a low rank and indicated that the student would not do well in shorthand. In several instances grades in other high school courses were taken into consideration in this study.

High school grades proved to be of importance in indicating

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good work habits which would also be important in shorthand.

The correlation between average high school grades excluding English and shorthand achievement is a significant factor in predicting the success of shorthand students. Correlations of .74, .73, and .67 would seem to indicate that students doing a good job in their other high school courses have developed good work habits, and consequently, they are more likely to succeed in shorthand. While grades in English were considered separately, it is unlikely that the correlations would have been different between grades and achievement in shorthand if the English grade had been included with those of other subjects.

Missling was very satisfied with the Turse Test as was revealed in her conclusions. The results of her study led her to believe high school marks were a very good predictor. The danger of using only one factor was also recognized by Missling. The conclusions she reached were as follows:

1. The study indicated that predictions made from total scores on the Turse test seem fairly reliable. Correlations show that all high school grades are the greatest factor in determining success of a shorthand student.
2. Numerous authors who have done studies of this type do not seem very well pleased with the results.
3. The results may have been more significant with larger groups over a longer period of time.
4. It is recommended, as a result of the findings of the study, that more factors be used for prognosis in shorthand than the Turse Aptitude Test. Because of the consistent and fairly high correlations of shorthand achievement with high school grades excluding English, grades should be used as a factor in predicting which students should be encouraged to enroll in shorthand.
5. From the evidence of the scores made by the students in this study more evidence should be placed on the teaching of mailable transcripts.

The writer has been discussing the screening and selecting of students in the hope of eliminating failures and dropouts. Perhaps if it could be learned what constitutes a shorthand dropout and what characteristics are predominant, a comparison could be made in the selection of students.
Meyer devoted her doctoral dissertation to this problem. In 1957 she reviewed her findings. She asked the question, "How does a shorthand dropout differ from a nondropout?" According to the results of her study, the dropout ranks lower in his class academically than the non-dropout, usually coming from the lower two-fifths of his class. He also had a lower average than the non-dropout in the marks received in his high school English courses and business courses other than shorthand. She also reported that in the majority of cases his high school marks in English and business courses were "C" or lower. He is more likely to have failed in one of his courses in high school than the non-dropout. His reading ability, which was determined by reading test results, is much poorer than is that of the non-dropout as is his reading ability. He is retarded in most cases. The dropout scored lower in the intelligence tests than the non-dropout and when he was compared with a non-dropout with a similar intelligence quotient, he had not made as much use of his intelligence in terms of what he achieved scholastically which was determined by comparison of I. Q. with rank in class.

Meyer summarizes her findings as follows:

The findings of this study indicate that while shorthand dropouts do differ from nondropouts, they are alike to a sufficient degree that a selectivity of students for shorthand is not justified on the basis of present knowledge. Instead there is a need for discovering why large number of students do not succeed in shorthand although they are similar to the students who do succeed.

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In 1957, as the close of the last decade approached, it was found that the concern was just as prevalent as ever in regard to finding a good method of prognosis in shorthand.

Hutson and Vincent felt that "Since shorthand is considered somewhat difficult to learn, dropouts and failures have come to be expected, and many teachers reluctantly accept this condition as inevitable if the standards are to be maintained." Cost of providing training for students without the aptitude for shorthand, along with the increase in enrollment, overcrowded classrooms, and scarcity of teachers, caused them to feel that it was becoming more and more imperative that we devise a good method for selection of shorthand students. Here again it was pointed out that many attempts had been made to predict success in shorthand but in most cases isolated factors had been used and the correlations had been sufficient for individual prediction.

A suggestion by Anderson caused Hutson and Vincent to conduct their study. When Gregg Shorthand Simplified was introduced there was a renewed interest in conducting research aimed at predicting shorthand success. Anderson suggested research be conducted to see what effect the reduced memory load in this new system had upon factors used to prognosticate achievement in shorthand. As a result of this, Hutson and Vincent conducted a study which attempted to answer the following questions:

A. Is there a relationship between actual achievement in the

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first year of Gregg Shorthand Simplified and the scores obtained on the Otis Quick-Scoring Mental Ability Test, the EIC Stenographic Aptitude Test, the Germane Vocabulary Test, the Lee-Thorpe Occupational Interest Inventory, and the adaptation of the Goodfellow Spelling Test?

B. Is there a relationship between achievement in the first year of Gregg Shorthand Simplified and English grades or all grades received before beginning study in the first year of Gregg Shorthand Simplified?

C. Is there a relationship between achievement in the first year of Gregg Shorthand Simplified and the chronological age of the student at the time of beginning the first year of Gregg Shorthand Simplified?

D. Is there a relationship between achievement in the first year of Gregg Shorthand Simplified and combinations of the factors mentioned above?

To be objective, the authors of this study used shorthand achievement rather than grades as the criterion of success in shorthand. This achievement was determined by performance during the last twelve weeks of instruction and a Final Achievement Record was devised on which a given student's progress was recorded.

The results indicated that the correlations obtained between the various prognostic factors and the Final Achievement Record were not sufficiently high to be used in predicting or forecasting. The .474, which was obtained between the Germane Vocabulary Test and success in shorthand, showed a definite trend but was not sufficiently high for prediction. In this study a correlation of .433 was found between the mental ability test and the Final Achievement Record. This compared favorably with other studies which had found correlations ranging from .34 to .51. They believed the correlations found between success in shorthand and the spelling test results were too low for prognosis. The correlations between chronological age and the Final Achievement Record were negative.
Other studies have produced identical results. They quoted Osbornel who stated this is to be expected "because the younger students in any class group tend to be brighter." She obtained a correlation of -.19 in her study.

They found the SRC Stenographic Aptitude Test did not correlate sufficiently with the Final Achievement Record to be of any use in prediction.

The multiple correlation of .568 that was obtained on this test was lower than the one obtained by Worley2 of .71 using average marks in modern languages, junior high school English, and I. Q.; and the multiple correlation of .76 obtained by Duncan3 with ninth grade English marks, tenth grade English marks, and the I. Q. Both of these men used shorthand grades as their criterion for shorthand achievement and Hutson and Vincent expressed the opinion that this was probably the cause of the high correlations.

They found a multiple coefficient of .568 in this study and believed it was too low to be effective in predicting individual success for students in beginning shorthand.

They concluded that these factors could not be used for predicting success stating: "It seems evident that the factors


measured by the prognostic factors used in this study could not be recommended for use in predicting success in beginning shorthand."

These authors indicated, as had many earlier authors, that motivation plays a very important part in prediction of success in shorthand:

... at the present time predicting individual success in shorthand, or in school subjects, merely by the use of tests has not been demonstrated where real achievement is demanded. The inability to ascertain or control motivation appears to restrict the success of tests in prognosis. For example, some students possessing "somewhat low" or average intelligence are successful in school work because they possess what many pupils with high I. Q.'s and little or no motivation for study fail to achieve.

It is evident that motivation, or the determination to succeed, cannot be measured. Since motivation cannot be measured, little can be expected from the use of tests to predict success in shorthand, for level of motivation appears to affect performance significantly when conditions are equal.

Here again it was found that measurement of shorthand success involves a number of interrelated factors. An acceptable test had not been devised. Meyer recognizes this by recommending caution and recognizing the absence of a valid test: "We must be certain before we do not permit students to take shorthand." Meyer recognized the need for an accurate approach based on scientific evidence. Meyer reviewed the results of data up to 1957. The review was very similar to the reviews of previous years' research which have been included in this study. A factor or factors have not been devised for a sufficiently high correlation necessary to predict success or failure:

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• a factor or combination of factors that will predict shorthand success with a high enough degree of confidence to prohibit students from taking shorthand is still unknown. Correlation in most cases is still too low.

Actually these tests and correlations predict approximately as accurately as a prediction based on chance. Meyer is of the opinion that the selection of students on the basis of present-day research cannot be justified. The teacher must allow all students a chance to succeed—unless a reliable test is devised.

In 1958, Strickland reported an attempt to determine criteria for predicting success in shorthand at East High School in Columbus, Ohio. Her purposes were to determine criteria and also to make recommendations for guidance services. She examined the cumulative records of 75 shorthand students. The measures she used were ninth and tenth grade English marks, scholastic average, Turse Shorthand Aptitude Test, and the language usage spelling and sentence test. Strickland also reported that the Readers Digest Reading Tests and the California Reading Test did not give correlations as high as the other measures. The predictive criteria that were sufficiently high for prediction were noted by the author as follows:

The correlation coefficients found between semester shorthand grades and the predictive criteria studied were high enough for the following six criteria to indicate value in prognosis: scholastic average, .660; ninth and tenth-year English marks, .620; Turse Shorthand Aptitude Test, .616; language usage spelling test, .506; language usage test, .540; and the intelligence quotient, .590.

Correlation coefficients of .603 to .659 were found between the California Reading Test and third and fourth semester shorthand grades.

From the results of the tests, Strickland noted that students who enrolled for vocational purposes had a lower failure rate than those who did not enroll for this purpose. Strickland stated:

"Students enrolling in shorthand with a vocational objective had a low failure rate compared with that of students taking the subject as a result of a friend's influence or just for fun."

It was interesting to note that as the writer's study closed with the year 1960, the problem in prognosis was very similar to the problem that existed in the early period of this study.

Di Bona described the failure and dropout problem: "Short-hand failures and dropouts are among the highest in the curriculum of the nation's high school."

Di Bona described a study conducted by the Bureau of Business Education in the city of Chicago in 1954. It was believed that more should be learned about this situation which results in so much unnecessary frustration for students and teachers.

Over a two year period, the staff members of the Bureau of Business Education and the Bureau of Child Study administered various tests in an attempt to determine who had the necessary requirements for success in the stenographic program. A study was

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conducted which included a follow-up of uses that were made of the skills learned. The study covered 697 students from five representative Chicago high schools. The instruments used were the Turse Shorthand Aptitude Test, the English average-grade scores for freshman and sophomore years. One-half of the students in each of the five high schools were given the Turse Test, and one-half the ERC Aptitude Test, except at School 5, where only the Turse Test was given. The following criteria were used: Stenography I grades; Stenography IV grades; a fundamentals, or theory test, called Achievement I in this study; and a transcription test at 60 and 100 words per minute which was called Achievement II in this study.

Di Bona felt Achievement II or transcription was the best school counterpart for business competence in shorthand; the decision for the best instrument for predicting shorthand success was based on the highest correlation between any one of the above-mentioned instruments and Achievement II. The Turse Aptitude Test was rated first as it had a coefficient of .52 and was therefore considered of more value than any of the other instruments. The ERC Stenographic Aptitude Test followed with a .47 coefficient. They were not considered sufficiently high, however, to be used as the sole instrument in predicting success in shorthand.

Teacher judgment of vocational competency, as indicated by the teacher grades in Stenography IV, placed the correlations with the two aptitude tests at .54 for the Turse Test and .48 for the ERC. The author believed these correlations were well in line with the more objective Achievement II correlation.
The second choice to the aptitude tests was the I. Q. because of the correlation of .40 to both Stenography IV grades and Achievement II and also to scholastic scores. Di Bona points out the fact that "Students with I. Q.'s as low as 81 completed the shorthand course, though I. Q.'s in the high 80's or low 90's, constitute wiser lower limits to shorthand enrollment. The higher I. Q.'s are not necessarily conclusive of higher achievement, unfortunately."

Di Bona noted that the correlations to I. Q.'s of .69 for Turse and .59 for ERC indicated strong correlations between the aptitude tests and the intelligence test, but that these correlations were not of sufficient significance to interchange one for the other. The English grades and scholastic scores correlated a low .31 which was slightly higher than the I. Q. and Stenography IV teacher grades. Di Bona believed these marks could be used as a third choice or to supplement the aptitude test and the I. Q.

A very interesting result pertaining to grades was set forth by Di Bona: "Students who registered F grades (barely passing) in English and their scholastic scores achieved success in shorthand, and, conversely, some of the better scoring students did not measure up to their English and scholastic scores."

Di Bona was of the opinion that a considerable number of good students are lost by way of dropouts. He stated that "There is little difference in I. Q.'s and grades between the students who completed the course and those that dropped out." The personal factor such as drive, enthusiasm, personal traits, neighborhood
mores, teaching techniques or some other intangibles are believed
to be as important as the native ability of the student. Di Bona
came to these conclusions:

... any willing student deserves to try out his potential
abilities in shorthand, tempered with counsel and diagnostic
help for the weaker students. The apparent lower limits are
scores of 220 for the Turse, 240 for the ERC, 90 for the I. Q.,
F plus grades (1.25-1.50 quality points) in English and in
scholastic scores; however, I. Q.'s as low as 61 or 130 scores
in aptitude tests, do not necessarily spell out failures.
Personal factors such as drive, enthusiasm, initiative, work
habits, or some other intangible enter into the picture for
both the weak and strong student, and may require strengthening.
The subtests of the aptitude test - stroking, phonetic associa-
tions, symbol transcription, word discrimination, dictation, and
word sense, may be used as a diagnostic device.

Di Bona's choices for prediction were as follows:

The Turse Shorthand Aptitude Test as the first choice, or ERC
Steno Aptitude test as second choice supplemented with a study
of personal traits, and/or English grades or English placement
tests, and/or scholastic averages, may give the counselor a
basis for guiding and helping the student in his endeavor to
master shorthand for professional competence.
Summary of Prognosis in Shorthand
from 1950 to 1960

The last decade opened with the prevailing question unanswered: "Who should take shorthand?"

To determine the answer to this question a study was made in Bound Brook High School in New Jersey which was concerned with the relationship of intelligence, typing, and ability in ninth grade English to success in shorthand. This study disclosed that 75 percent of the students with I. Q.'s under 100 turned out work in this subject that was below what could be expected to develop into skill that would be commercially useful. Three-fourths of the Typewriting I students with grades under 80 did work in shorthand that would not pass as acceptable in the commercial field. Only two of fifteen Stenography I students with English grades below 80 developed skills in shorthand that were commercially useful. Only 30 percent of the students with I. Q.'s under 100 did reliable work in Shorthand II. One student out of ten in Stenography II who had grades under 80 in ninth grade English did acceptable work in Shorthand II. When students achieved 80 or above in ninth grade English, the chances of good grades in Shorthand II appeared to be approximately two out of three. The data from this study appeared to indicate that typing should be first as a supporting factor for success in shorthand, ninth grade English second, and the I. Q. would be third.

Hoke and Turse tests received an evaluation when Dame stated that the relationship between test scores and achievement
in general had been too low to warrant full acceptance of these for
the purpose of prediction in shorthand.

The status of shorthand prognosis was brought up to date
in this decade by Morgan. He reviewed various studies and as a
result of his review suggested the following factors for a battery
which would result in a reasonably reliable test: English grades,
I. Q., pupil desire, aptitude test scores, and pupil interest.
Morgan himself believed low ability students should be discouraged
from enrolling in vocational subjects such as shorthand and advanced
bookkeeping.

Jack conducted two studies that revealed a greater correla-
tion between the Turge Aptitude Test and the second year of shorthand
than between the Turge Aptitude test and first year shorthand. He
also determined the I. Q. to be of greater value for use in second
year stenography. English did not appear to result in a significant
correlation. He believed the Turst Shorthand Aptitude Test had
shown sufficient results to be worth further trial and investigation.

Costello too believed there should be a selective program
for admittance to business education courses but that no one should
be restrained from taking typewriting and shorthand for personal use.
According to Costello, there is a definite correlation between
intelligence and the ability to succeed in secretarial work. Tests
should be administered which would include this factor. Rating
skills should be used to supplement these tests.

Duchand questioned the methods of teachers who relied
upon the intelligence quotient and reading ability as the sole
determinants of success in shorthand. He conducted a test and failed to note definite trends or relationships between either of the two factors. His feeling was that the most important factor was motivation. A highly motivated teacher would perhaps be one of the most important factors.

The necessity of screening students was again voiced during this decade by Linnane. The methods he suggested for selection were: results of intelligence tests, academic record, use of exploratory courses, and the prognostic test. Linnane believed the basic tools of stenography were a command of the English language and good handwriting. Aptitude tests also had a place in use for prognosis.

Hiasling conducted a test at the midpoint of this decade to determine if prognostic testing was an effective method of predicting success in shorthand. She believed the predictions made from total scores on the Turse test seemed fairly reliable, but she also suggested using additional factors for prognosis to supplement the Turse test. Grades were suggested because of the fairly high correlations of shorthand achievement with marks.

Meyer attempted to solve the problem of prognosis from a different angle by devoting her doctoral dissertation to the question of how a shorthand dropout differs from a non-dropout. She determined that they differed but not sufficiently to justify barring them from enrolling in shorthand. Teaching effectiveness should be considered as an important factor in favor of success.

Overcrowded conditions and increased costs were factors
which Hutson and Vincent pointed out to stress how imperative it was to determine an effective method of selection of shorthand students. They, as many others before them, deplored the fact that single or isolated factors had been used in conducting tests. These men conducted a test after the **Gregg Shorthand Simplified** system was introduced to determine what effect the reduced memory load had on the factors used for predicting success in shorthand. They arrived at the conclusion that the various factors could not be used even with the new test materials. They believed that the inability to control or ascertain motivation restricts prognostic testing in shorthand.

Meyer echoed these sentiments when she reviewed the data. She also stated that up to this time we do not have a factor or combination of factors that give a sufficiently high correlation to predict success or failure in shorthand.

Strickland attempted to determine shorthand prognostic criteria at East High School in Columbus, Ohio. Results disclosed that students who received high grades in shorthand also scored high in intelligence, English marks, scholastic averages, Turse Shorthand Aptitude Test, and the language usage spelling and sentence test. He also noted that students enrolling with a vocational objective had a lower failure rate than those who enrolled for other reasons.

As this decade closed in 1960 the same problems existed as were present in 1914. Di Bona described the situation by citing the shorthand failures and dropouts which were the highest in the
curriculum in the nation's high schools. She described the situation as existing in Chicago, and it was decided to remedy this unnecessary frustration on the part of students and teachers. The results of her study implied that any willing student deserves to try his potential abilities in shorthand. This should be tempered with counsel and diagnostic help for the weaker student. Prediction is difficult because of personal factors and intangibles that always enter into the picture and cannot be measured effectively.
CHAPTER IV

SUMMARY AND RECOMMENDATIONS

This study is a history of prognosis in shorthand from 1914 to 1960. It represents a review of articles from periodicals, theses, and textbooks.

In Chapter III selected studies pertaining to prognosis in shorthand and the opinions of business educators are arranged chronologically. It is believed this arrangement will enable the reader in tracing the developments in prognosis in shorthand.

Analysis of Shorthand Prognosis by Decade

There has been considerable interest in prognosis in shorthand since the first prognostic test was administered in 1914. Many studies have been conducted and many opinions have been expressed in the hope of directing the way toward successful prognosis in shorthand.

The writer will review what he believes to be the highlights of the various periods included in this study.

During the early period of this study from 1914 to 1930 limited activity was reported. It was an important period, however, because during this time was the real beginning of prognostic testing. One important discovery made by a business educator was that a battery of tests would be more effective than a single test. This fact was emphasized again and again by many researchers.
Another early discovery was that low intelligence quotients do not always indicate low scores in shorthand. There is, in fact, a possibility that low I. Q. students can achieve high grades.

In general, the administrators of tests in prognosis in shorthand felt their tests were not entirely satisfactory. They were of the opinion, however, that their tests showed some promise and that further research might develop a more predictive device.

The decade of 1930 to 1940 was marked by a great deal of activity in shorthand prognosis. Unique about this decade were the large variety of factors tested and discussed.

One author was certain that manual dexterity was necessary to success in shorthand. Another business educator, however, stated he felt the lack of English background, and not manual dexterity, was the cause of shorthand failure.

Closely related to the conflicting opinions mentioned above was a study conducted to determine whether there was a correlation between English marks and success in shorthand. The researcher found these marks to be of no more value than marks received in other high school subjects, in fact, marks in modern languages were found to have a much higher correlation with shorthand success.

Standard instruments were tested for utilization with the researcher deciding in favor of the Hoke Prognostic Test as being the most adequate single instrument for predicting success in shorthand.

Exploratory courses were discussed as a factor not
considered to be of value by one researcher as he believed they would be concerned with the study of shorthand theory principles and could not measure characteristics important to shorthand success such as manual dexterity, word sense, good vocabulary, and a mastery of sentence structure.

One other interesting conclusion reached during this decade by a business educator was that prognosis applied to other high school subjects with approximately the same accuracy as to shorthand.

Considerable activity was also reported in the decade from 1940 to 1950. Motive, or internal drive, was introduced as a factor in predicting success in shorthand. Motive cannot be measured accurately, however; and, until a device is found which will measure drive, desire, and need, motive cannot be considered as a measuring device but rather as a guide for the teacher.

One educator was very enthusiastic about the prognostic future of "word sense" and phonetics. He believed they were two necessary abilities for shorthand.

The value of the I.Q. in prognosis proved to be an area of conflict with some authors placing considerable emphasis on the I.Q. as a prognostic device while others did not feel it was of importance as a factor for predicting success in shorthand. One researcher pointed out that it was the average and slightly below average students who seemed to show the most success in shorthand.

Exploratory courses were considered by a team of three authors who felt they could be of value as a guidance device for future shorthand students.
In one comprehensive analysis of literature pertaining to shorthand prognosis, a researcher reported that a number of investigators found English marks, scholastic achievement, and foreign language marks to be the best measures yet selected to predict success or failure in shorthand.

The last decade of this study, 1950 to 1960, produced more attempts to determine factors which would predict success in shorthand. The introduction of Gregg Shorthand Simplified brought about a renewed interest in shorthand prognosis.

One study appeared to indicate that typing should be considered of first importance as a supporting factor for success in shorthand. Ninth grade English was believed to be second in importance as a factor, and the I. Q. was believed to be third in importance in predicting shorthand success.

Another researcher suggested the following factors as a battery which would result in a reasonably reliable test: English grades, I. Q., pupil desire, aptitude test scores, and pupil interest.

The Turse Shorthand Aptitude Test was believed by one researcher to be of more value for use in predicting success in second year shorthand than for first year shorthand.

Handwriting was introduced in this decade in conjunction with a command of the English language. These criteria were believed by one business educator to be the basic tools of success in stenography.

A conclusion reached by another researcher was that characteristics of dropouts in shorthand differ from non-dropouts.
but not sufficiently to bar students from shorthand.

Good grades were believed to be of value in the prediction of success because they were indicative of good work habits, which are very important to shorthand success.

**General Summary**

A great deal has been done in shorthand prognosis; however, there was general agreement that a great deal remains to be done before we can exclude students from taking shorthand.

Single prognostic tests should not be used to determine who will succeed in shorthand. The Hoke Prognostic Test was used frequently in studies conducted and a more recent test, the Tursen Prognostic Test of Stenographic Ability, was also used in many studies. However, these tests are not as yet completely valid and therefore, cannot be used as a single factor in the prediction of shorthand success.

The same principle holds true for single factors such as English marks, I. Q., language aptitude, and so forth. Factors thus far investigated have not shown sufficient predictive value to be used solely or in conjunction with another factor for prediction of success in shorthand.

The insufficient number of cases or students used in studies seems to be one of the reasons for failure in establishing an effective device for the prediction of success or failure in shorthand.

In general, business educators and researchers believed that selection was desirable because of the large amount of
shorthand failures. Cost per pupil and overcrowded conditions also make it imperative that a good selection device be established.

The best way to select students for shorthand seems to be the use of a number of criteria, as many as four or five, in conjunction with the best shorthand aptitude test. At least this many criteria should be involved before any decision can be reached as to who should be permitted to take shorthand.

**Recommendations**

This study is a history of prognosis in shorthand taken from the literature pertaining to prognosis. On the basis of the information obtained the following recommendations are intended to encourage more effective research in shorthand prognosis.

1. That researchers use a larger number of cases in conducting studies.
2. That more research should be conducted on standard instruments which predict ability in shorthand.
3. That more research should be conducted which involves the use of as many as four or five factors as a criteria rather than the use of single factors for study in the prediction of success in shorthand.
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