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1967
A COMPARISON OF THE LEARNING DIFFICULTY OF FORKNER ALPHABET SHORTHAND AND GREGG SHORTHAND (DJ)

DISSERTATION

Presented in Partial Fulfillment of the Requirements for Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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......

The Ohio State University
1966

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CHAPTER I

THE PROBLEM

At the present time, Gregg Shorthand is the most widely used shorthand system in the United States. More than 96 per cent of the high schools and colleges which offer shorthand use Gregg.1 At least two years of training have been recognized as necessary for the development of vocational competence.

The authors of Gregg Shorthand state that after one year of study students should be able to record new material of average difficulty dictated at rates of 60 to 80 words a minute for a period of five minutes.2 In addition, they state that the students should be able to transcribe in longhand or on the typewriter at rates of 15 to 20 words a minute, with a 5 per cent error allowance. The 60 word-a-minute dictation rate and the 15 word-a-minute transcription rate represent the minimum requirements.

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In 1952, the Forkner Shorthand System was introduced. The author stated that this system can be learned in half the time required of the traditional systems; and that the same standards can be achieved. Since the 1940's there has been increased pressure to require all students to take more general and scientific studies with a result of less time for subjects such as shorthand. If the learning time for developing competence in shorthand can be reduced by one-half through the use of one system of shorthand, then additional time will be available for other subjects and activities. The demand for stenographers and secretaries at present exceeds the supply in most parts of the country, and office occupations have been predicted to increase by 27 per cent during the 1960's. With the pressure for shortening the learning time and at the same time meeting the needs of offices, a system of shorthand which could reduce the learning time would be of great importance.

**Purpose of the Study**

The purpose of this study was to determine the learning difficulty of the Forkner Alphabet Shorthand System as compared with the Gregg Shorthand System, Diamond

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Jubilee Series, as measured by the dictation speed and standard words correctly transcribed of eleventh- and twelfth-grade high school students.

Need for the Study

Gregg Shorthand is used in more than 96 per cent of the schools which offer shorthand in the United States. In recent years, longhand adaptations or abbreviated longhand systems have created pressures against the traditional systems.

Concerning the increased use of the abbreviated longhand systems, Tonne makes the following statement:

In recent years they [abbreviated longhand shorthand systems] have gained a foothold in the private and even in the public schools, and there are many authenticated cases of successful users of these procedures on the job.5

Authorities in business education do not agree on the importance of the abbreviated longhand shorthand systems and the probable effect upon the traditional symbol systems of shorthand. When asked what effect these abbreviated longhand systems would have upon the traditional systems, Lomax stated that a thorough comparative research study of ABC shorthand systems and symbol shorthand systems

should be made to determine how well the ABC systems meet usage requirements.6

Comparative research of this type is limited. Reviews of research studies of this type which have been completed are presented in Chapter II. Limited research in this area is confirmed by Tonne when he states that "there has been little research into the use of abbreviated longhand for use in office dictation and none that is even definitely suggestive of the possibilities for real time saving and maximum top speed."7

After an intensive analysis of research and thought pertaining to shorthand and transcription, Frink concluded that there is a need for nonsymbol shorthand and "that there was evidence that nonsymbol shorthand can be learned in less time than traditional shorthand and that it has a definite potential for vocational use."8

Two years have generally been recognized as the amount of time needed for the development of vocational competence for Gregg Shorthand writers. Some controversy


7 Tonne, loc. cit.

exists today, however, concerning the amount of time needed for developing initial job competency for stenographers. After surveying the opinions of recognized authorities in the field of business education, Gratz concluded that "to provide minimum initial job competency as a stenographer, the shorthand course should be a three- or four-semester course including transcription."  

Concerning the question, Does Forkner Alphabet Shorthand reduce learning time? the following comments are made by Forkner:

Experience since 1952 in high schools, colleges, adult classes and home-study courses where typewriters are available shows that:

1. A person with exceptional ability in typewriting, English vocabulary, and office know-how can be ready for a stenographic position in 60 to 90 periods of the day or evening classes.

2. A person with average ability can be ready for a stenographic position in 120 to 180 class periods [24 to 36 weeks of class with five meetings a week].

These goals can be reached because so little time is needed to learn the theory that transcription skills can be developed beginning with the first week of the course.

Concerning the Forkner Alphabet Shorthand System, Lamb makes the following statements:

Forkner Alphabet Shorthand has both personal-use and vocational value, since it is designed for recording dictation up to 120 words a minute,

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9Gratz, op. cit., 71.

but the training time required is much less than that required for symbol systems. It has been taught in high schools, in adult classes, business colleges, and junior and senior colleges since 1952, with students attaining speeds of from 80 to 100 words a minute in approximately ninety 45-minute periods, or in one semester of evening classes that meet four hours a week.\footnote{Marion M. Lamb, \textit{Your First Year of Teaching Shorthand and Transcription} (Cincinnati: South-Western Publishing Company, 1961), 6.}

Comparative research with Forkner Alphabet Short-hand and a symbol system such as Gregg has not been completed. There is a need for research to compare student achievement and progress in the Forkner Alphabet and Gregg Shorthand systems. Classroom experimentation is needed to substantiate the claims made by the author of the Forkner Alphabet Shorthand System that this system can reduce the learning time and at the same time develop the same level of proficiency on the part of the shorthand writers.

\textbf{Definition of Terms}

The following are definitions of important terms which are used throughout this study:

1. \textbf{The level of dictation speed} refers to the number of words dictated in one minute by the dictator.

2. \textbf{A standard word} refers to a word with 1.4 syllables.
3. Achievement refers to the number of standard words correctly transcribed for each letter.

4. Above-average high school achievers refers to students with a grade-point average of 3.00 and above on all high school courses taken in Grades 9 and 10 based upon a four-point scale.

5. Average high school achievers refers to students with a grade-point average of 2.00 to 2.99 on all high school courses taken in Grades 9 and 10.

6. Below-average high school achievers refers to students with a grade-point average of 1.99 and below on all high school courses taken in Grades 9 and 10.

7. New matter dictation refers to dictation material which has been neither previewed nor practiced by the students.

8. Syllable intensity is a measure of material difficulty and is determined by dividing the total number of syllables by the total number of words in the dictation material.

9. Silverthorn word list refers to the list of words arranged in order of frequency of use by Silverthorn. The list is based on a study of over 300,000 running words in written business communications.\(^\text{12}\)

\(^{12}\text{J. E. Silverthorn, Word Division Manual for the Basic Vocabulary of Business Writing (Cincinnati: South-Western Publishing Company, 1958).}\)
10. **Dictation set** refers to a series of six letters prepared for each testing period. Three dictation sets were used in the study.

11. **Brief form (Gregg)** refers to words which are not written in full according to principle.

12. **Word abbreviations (Forkner)** refers to words which are not written in full according to principle.

**Questions to be Answered**

Answers to the following questions were sought:

1. How does the learning progress in first-year classes of Forkner Alphabet Shorthand compare with the learning progress in first-year classes of Gregg Shorthand as measured by levels of dictation speed and standard words correctly transcribed?

2. Is the Forkner Shorthand System or the Gregg Shorthand System better adapted to the above-average high school achievers, average achievers, or below-average achievers as measured by levels of dictation speed and standard words correctly transcribed?

More specifically, answers were sought to the following questions:

1. Do students in each shorthand system achieve differently?

2. Do students in each shorthand system achieve differently at each speed level?
3. Do students in each shorthand system achieve differently in each grade-point average level?

4. Do students in each shorthand system achieve differently in each set of dictation?

5. Do students in each shorthand system achieve differently at each speed level in each grade-point average level?

6. Do students in each shorthand system achieve differently at each speed level in each set of dictation?

7. Do students in each shorthand system achieve differently in each grade-point average level in each set of dictation?

8. Do students in each shorthand system achieve differently at each speed level in each grade-point average level in each set?

**Assumptions**

The following assumptions were made for this study:

1. The effect of the teacher would be minimized by using a number of teachers.

2. Achievement in shorthand is an index of shorthand difficulty; the transcript can be used as a measure of the levels of achievement of the students.
Limitations

The following were limitations of the study:

1. The study was limited to 8 classes of Forkner Shorthand taught by 8 selected teachers and 10 classes of Gregg Shorthand taught by 10 selected teachers.

2. The study was limited to students in Grades 11 and 12 during the 1965-1966 school year.

3. The study was limited to first-year shorthand classes, with vocational use as the primary purpose, and to those students who were learning the system for the first time.

4. Measurement was limited to the transcripts of the students during the second semester.

5. Each letter of the dictation material was limited to a specific speed, new matter, and three minutes in length.

Organization of the Study

This report of the study is organized in the following manner:

In Chapter I the problem, purpose of the study, definition of terms, questions to be answered, need for the study, assumptions, limitations, and organization of the study are presented.

In Chapter II a review of the related research studies and literature is given.
In Chapter III a detailed explanation of the method of procedure is described.

In Chapter IV school, teacher, and student background factors for each shorthand system are compared.

In Chapter V the analysis and interpretation of the data gathered during the study are discussed.

In Chapter VI the findings, conclusions, and recommendations for further research are presented.
CHAPTER II

REVIEW OF RELATED RESEARCH

The literature in the field of shorthand was examined for experimental research involving two systems of shorthand. In addition, research studies which presented information that could be used in the construction of dictation material were examined. Only those studies closely related in purpose or procedures to the present investigation were included in this chapter.

The studies are presented in alphabetical order.

The Harper Study

The purpose of the Harper study was to compare the achievement of high school students completing the one-semester Briefhand course with the achievement of high school students completing one and two semesters of Gregg Shorthand, Simplified.¹

From a total of 391 students in five different schools, a sample of 70 students' transcripts for each shorthand system - a total of 140 students' transcripts -

was selected for analysis purposes. Twelve 3-minute letters, taken from the Pitmanite, were dictated to the students at the end of each semester. Two letters for each of the speed levels of 50, 60, 70, 80, 90, and 100 words a minute were used for the dictation material.

The transcripts were handwritten and were scored according to the number of errors made. Verbatim transcription was the measure of success. Spelling, punctuation, and paragraphing were not considered in the analysis. Total error scores were determined on each of the 12 tests for the 140 students. Each two tests at the same speed by each pupil were averaged. The t-test was used for statistical treatment of the data.

The major findings of this study were as follows:

1. The difference between Gregg I and Briefhand was significant at 50, 60, and 70 words a minute in favor of Briefhand.

2. The difference between Gregg I and Briefhand was not significant at 80, 90, and 100 words a minute.

3. The difference between Gregg II and Briefhand was not significant at 50 words a minute.

4. The difference between Gregg II and Briefhand was significant at 60, 70, 80, 90, and 100 words a minute in favor of Gregg II.

Harper concluded that two semesters of Gregg Shorthand, Simplified, were more effective than Briefhand at all speed levels ranging from 50 to 100 words a minute.

The present study and the Harper study are related in that both were experimental studies concerned with two
systems of shorthand and both used high school students. Purpose and procedures were also similar.

The Harper study measured terminal achievement of the students, whereas the present study measured achievement at five-week intervals during the second semester of study. In the Harper study, the same dictation was given to the students in the first and second semesters of Gregg. In the present study, no letter was repeated in the series of three sets of dictation material. In addition to the criterion of 1.4 syllable intensity used by Harper, the first 200 words appearing on the Silverthorn list were used in the present study as an additional criterion in the construction of the dictation material.

The Hillestad Study

The major purpose of the Hillestad study was to determine factors which could be used to predict the difficulty of dictation materials as measured by the number of errors in Gregg Shorthand notes. A subpurpose was an analysis of the number and kinds of errors made in the shorthand notes of the fourth-semester Gregg Shorthand students. The hypothesis tested was this: There was no

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significant relationship between each of the independent variables and the dependent variable (number of errors).

One hundred letters of 160 words each were constructed from letters representing a variety of businesses and incorporating a wide vocabulary and coverage of shorthand principles. The letters were dictated to fourth-semester shorthand students in eight high schools. The material was dictated by the teachers of the regular shorthand classes at a rate that the students could write satisfactorily, since speed was not a factor in the study.

A random sample of five papers was selected from each of the eight classes for each of the 100 letters. The sample included 4,000 papers and contained 640,000 shorthand outlines.

The number of errors of shorthand outlines made on the 40 papers selected at random for each of the 100 letters was used as the dependent variable. The following were used as independent variables: syllables; brief forms; vocabulary index; brief form derivatives; oo sounds; o sounds; diphthongs; are, air, er sounds; terminal t's; plural endings; past tense endings; other endings; disjoined endings; word beginnings; and words beyond the first 1,500 of the Silverthorn list.

An error was counted for each incorrectly written or omitted word. An outline was considered correct if the proper letters were used regardless of the direction in
which they were written with the exception that when a reversed stroke produced a different letter, an error was charged. The statistical treatment used was correlation and multiple regression.

The major findings of this study were as follows:

1. The highest percentage of errors occurred in brief form derivatives.
2. Fewer errors occurred on brief forms than on any other type of shorthand outline.
3. Error rate tended to increase as words became longer.
4. Error rate was more directly related to vocabulary level than to length of words.
5. More errors were made in principles of shorthand theory with inconsistencies or exceptions than those which did not vary.
6. Students tended to write the principal vowel in each word, and a t was written at the end of words where it was not needed.
7. Fewer errors were made on the first 1,500 words of the Silverthorn word list.
8. Syllables and vocabulary level index gave the best prediction of the number of shorthand errors that the students were likely to make.

Using the number of syllables and number of words ranking beyond the 1,500 level of the Silverthorn list, Hillestad developed a formula for predicting the number of shorthand errors. From her study, she concluded that the difficulty of materials can be predicted.

Although a formula was given for the use of predicting the difficulty of dictation material, the predicted
errors were for the shorthand notes and not for errors in the transcripts. Use of the formula would not be practical for regular class use. Also, the dictation material did not contain an equal number of the various elements used as independent variables.

The present study is related to the Hillestad study in that both used revised letters from businesses and used the Silverthorn list in constructing the letters. Because the Hillestad study showed that fewer errors occurred on brief forms than on any other outlines, the use of a percentage of brief forms as a criterion for the construction of the dictation material was not used. Also, this criterion was not used because the two systems of shorthand did not have the same words as brief forms and abbreviated words.

The Silverthorn Study

The purposes of the Silverthorn study were to determine the frequency with which words in written business communications were used and to determine whether or not the usage of words had changed from an earlier list (Horn-Peterson word list). Written business communications of various types - business letters, intercompany communications, telegrams, and reports - were obtained from James Edwin Silverthorn, "The Basic Vocabulary of Written Business Communications" (Ph.D. dissertation, Indiana University, Bloomington, 1955).
different categories of businesses. A sampling technique was used for the selection of letters for analysis purposes. The number of letters selected from a given type of business was in proportion to the probable volume of written communication carried on. The criterion used for estimating the communications of each category was the percentage of all secretaries, stenographers, and typists who were employed in the category of business.

A comparison was also made with another word list, the Horn-Peterson frequency list, which was made at an earlier date.

The major findings of the Silverthorn study were the following:

1. A total of 300,000 running words was tabulated from 2,039 pieces of written communication representing 1,012 different firms in 41 different states.

2. The number of words encountered one or more times was 11,564.

3. The 50 words used most frequently accounted for about 45 per cent of all running words; the 100 words used most frequently, approximately 50 per cent; the 500 words used most frequently, approximately 70 per cent; the 1,000 words used most frequently, approximately 80 per cent; and the 5,000 words used most frequently, about 95 per cent.

4. The word "the" was first in frequency, with the number of occurrences accounting for about 5 per cent of the running words.

5. Of the 50 most frequently occurring words, 37 appeared in the first 50 of the Horn-Peterson frequency list.
6. Of the 100 most frequently occurring words, 65 were in the first 100 of the Horn-Peterson frequency list. Silverthorn concluded that the usage of words had changed little since the communications were written from which the words for the Horn-Peterson list were taken.

The Silverthorn study was used in the present study to obtain a list of the 200 most frequently occurring words. Approximately 65 per cent of the total words in each letter in the dictation materials consisted of those from the first 200 of the Silverthorn word list.

The Stewart Study

The purpose of the Stewart study was to determine whether there was a significant difference in the achievement of the students in Thomas Natural and Gregg Simplified shorthand systems at the end of one year of high school study. 4

For purposes of analysis, a 100-word theory test and four 3-minute dictations were used. The four 3-minute dictations were at the speeds of 60, 80, 100, and 120 words a minute. The theory test was taken from the Gregg Simplified Manual, and the dictation material was taken from issues of The Christian Science Monitor.

4 Katherine Knox Stewart, "A Comparison of the Achievement of Students in Thomas Natural Shorthand and Gregg Simplified Shorthand at the End of One Year of High School Study" (Master's thesis, University of Nebraska, Lincoln, 1950).
A total of 603 students from 21 different schools was used for the study. A point system was devised for correcting the transcripts. The arithmetic mean and standard deviation were used for statistical treatment of the data. Transcription was either by typewriter or longhand.

The major findings of this study were as follows:

1. The Gregg students had a 7.68 higher mean score on intelligent quotient than the Thomas students, which was statistically significant.

2. The difference in the mean scores for the two groups on the theory test was 13.66 points, which was statistically significant in favor of the Thomas Natural Shorthand students.

3. On all speeds (60, 80, 100, and 120 words a minute), Thomas student mean scores were significantly higher than those for the Gregg students.

From her findings, Stewart concluded that the Thomas writers performed better than Gregg writers in achievement in the first year of shorthand at all levels.

The difficulty of the material taken from The Christian Science Monitor was not stated. Criteria for the content of the dictation material were not stated. For each dictation at each level, ten minutes were allowed for transcription. For the 100 and 120 word-a-minute dictations, students would have had to transcribe at the rates of 30 and 36 words a minute, respectively.
In the Stewart study, the determination of scores for the transcripts was done in two ways. One method was used if the student had transcribed a predetermined amount of dictation and another if less than that amount had been transcribed. For the transcripts having the predetermined amount, 1 point was deducted for each word incorrectly transcribed, but only one-tenth of a point was deducted for each word omitted in the transcript. For the transcripts with less than the predetermined amount, the correct words transcribed were used for the basis of the score. The use of the two methods of scoring could have had some effect upon the results of the study.

The present study and the Stewart study are related in that both are experimental studies dealing with two shorthand systems and similar in purpose and procedures.

The Stoddard Study

The purpose of the Stoddard study was to compare the achievement of university-level students in Gregg Simplified Shorthand and StenoSkill Shorthand in terms of writing speed. The study was based on an analysis of the transcripts of tests given to a total of 139 college students after one semester of study at Brigham Young University.

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University, Provo, Utah, during the 1962-63 academic year. There were 76 students enrolled in the Gregg classes and 63 students enrolled in the StenoSkill classes.

Dictation material of three minutes in length for each of the speeds of 50, 60, and 80 words a minute were given to the students at the end of the semester from taped recording. The students transcribed on the typewriter.

A duplicated transcript of each letter was used for checking the transcript of each student. Students' transcripts were corrected on the basis of standard words correctly transcribed. The standard words correctly transcribed were divided by three, which gave a per-minute score. This score was used as the basis for comparison of the two groups. Critical ratios were used for statistical treatment of the data. Grade-point average was used to compare the equivalency of the two groups.

The major findings of this study were as follows:

1. On the test at 50 words a minute, students in the Gregg group could take shorthand at an average rate of 45.6 words a minute; StenoSkill students, 49.8 words a minute.

2. On the test at 60 words a minute, students in the Gregg group could take shorthand at an average rate of 46.5 words a minute; StenoSkill students, 56.65 words a minute.

3. On the test at 80 words a minute, students in the Gregg group could take shorthand at an average rate of 56.7 words a minute; StenoSkill students, 73.15 words a minute.
4. There was a significant difference between the means in favor of the StenoSkill group for each of the letters dictated at 50, 60, and 80 words a minute.

From the findings of this study, Stoddard concluded that in terms of writing speed after one semester, StenoSkill Shorthand was superior to Gregg Simplified Shorthand.

The use of the per-minute score in the Stoddard study leads to some confusion. In the findings, statements are made that the students could "take" shorthand at an average speed of so many words a minute. The dictation was given at a specific speed, and the students were able to transcribe a certain amount at that specific speed. Indicating that the students could "take" dictation at a figure lower than the speed of dictation seems misleading. The per-minute score seemed unnecessary. The explanation of the construction and content of the dictation material was omitted from the report of the study.

The present study and the Stoddard study were related in that they were experimental studies concerned with two systems of shorthand. The two studies were also similar in purpose and procedures.

The Winter Study

The purpose of the study by Winter was to ascertain the speed of dictation by dictators in actual business
The study was based on the examination of 253 actual business letters that were dictated by 87 different business and professional men and women to their own stenographers.

The investigator sat within hearing distance of the dictation and recorded the first words of the letter and the time the words were spoken. At each one-minute interval, the words being spoken were recorded. The exact time the letter was finished was also recorded. Timing was stopped if an interruption occurred, since actual time spent in dictation was desired. A carbon copy of the timed letters was used as the basis for determining the number of words per minute in each minute of the dictation. The dictation was figured by the following methods: actual words, standard words, and five-stroke words.

The major findings of this study were as follows:

1. Of the 253 letters, 213, or 84.19 per cent, were under three minutes in length; 236, or 93.28 per cent, were shorter than four minutes in length.

2. The results of tabulating the letters by actual number of words, standard words, and five-stroke words were similar.

3. Those letters less than one minute in length showed the greatest range in speed and also the highest speed.

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4. Letters over four minutes long showed less of a tendency to extremely fast or slow speeds than did the shorter letters.

5. The average business letter was found to be dictated at 75 to 80 words a minute.

6. The mean speed of all the dictation timed was 74.98 on the actual word chart, 78.86 on the standard word chart, and 78.21 on the five-stroke word chart.

7. Two-thirds of the dictation was between the speeds of 105.74 and 48.52 words a minute.

From the findings of this study, Winter concluded that all stenographers should be able to write at least 79 to 80 words a minute as a minimum requirement. She also concluded that the stenographer should be able to write shorthand at least 100 words a minute in order to take most of the dictation given in the average office.

The present study used three-minute dictations based upon the finding made by Winter that about 90 percent of the letters were shorter than four minutes in length. The use of 100 words a minute was used as the maximum speed for consideration in the present study because Winter's study revealed that this speed was sufficient for use in the average office.

Another study, which compared the merits of Script Shorthand and Gregg Shorthand, was found but was not included in the review of literature because of its faulty
method of procedure and lack of clear explanations.  

The report of the study was contradictory and vague in places and did not draw any major conclusions except that Script was superior to the Gregg system. The study was financed by the Script Shorthand Company.

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CHAPTER III

PROCEDURES FOR CONDUCTING THE STUDY

The experimental method of research was used in the study, which was conducted during the second semester of the 1965-1966 school year. A detailed explanation of the methods of procedures used for collecting the data is given in the following paragraphs.

Selection of Participating Schools

In order to decrease the influence of any one teacher, a minimum of 10 schools for each shorthand system was sought to participate in the study. The following criteria were used in the selection of schools for the collection of the data:

1. Willingness of the teacher to participate
2. Two semesters as the length of the shorthand course
3. Vocational goal as the primary purpose of the shorthand course

The method of selection of the participating schools for each shorthand system is explained in detail in the following paragraphs.
A preliminary list of schools offering Forkner Alphabet Shorthand was obtained from Dr. Hamden L. Forkner, author of the system. A letter explaining the proposed study and asking for permission to use the shorthand classes for the study was sent to the superintendents of 17 different schools listed. A copy of this letter is included in Appendix A. The name of the Forkner Shorthand teacher was also requested.

Three replies were received indicating that they did not want to participate in the study – one reply stated that Forkner Shorthand was no longer offered in that school; one reply indicated no interest in participating; and one reply indicated that the school system was in the process of a study and did not want to be included in the present study.

Favorable replies were received from 14 different schools. A letter was then sent to each of the 14 Forkner Shorthand teachers in these schools asking if he was willing to participate in the study and requesting the number of students enrolled in each Forkner Shorthand class. A copy of this letter is given in Appendix A. Fourteen teachers, representing 14 different schools, agreed to participate.

Five of the teachers who agreed to participate in the study taught either a one-semester or two-semester,
personal-use Forkner Shorthand course and were not used. One other teacher indicated that the second semester of Forkner Shorthand would not be given, and therefore he could not participate.

Thus, from a total of 17 schools in which Forkner Shorthand was taught, 8 different schools were used for the collection of the data.

**Gregg participating schools**

After obtaining the list of participating Forkner schools, the selection of the Gregg Schools was begun. Friends of the investigator suggested 10 persons who taught Gregg Shorthand, Diamond Jubilee Series. A letter was sent to the superintendent of each of the schools in which these teachers were employed asking for permission to use the first-year Gregg Shorthand classes in the study. Favorable replies were received from all 10 schools.

In addition, letters were sent to superintendents in 9 different schools chosen at random from a directory of secondary schools asking for permission to use their shorthand classes in the study. Replies were received from 6 schools, with only one agreeing to participate.

Two schools were obtained through the Student Field Experience Office at The Ohio State University. However, only one of these schools was used in the collection of the data because one school taught the Simplified Edition of Gregg Shorthand.
After permission was received from the 12 superintendents, a letter similar to the one sent to the Forkner Shorthand teachers was sent to each of the 12 Gregg Shorthand teachers in these schools asking if they were willing to participate in the study and requesting the number of students enrolled in each first-year Gregg Shorthand class. Twelve Gregg teachers, representing 12 different schools, agreed to participate.

Each of the 14 Forkner teachers and 12 Gregg teachers was sent a form requesting background information about the school and the teacher; in addition, another form requesting background information about each student was also sent. A copy of each form is presented in Appendix B. The information gathered is presented in Chapter IV.

One of the Gregg teachers who agreed to participate decided later not to participate since a student teacher was assigned to the shorthand class. Another teacher omitted part of the taped dictation for each set of dictation material and therefore was not used.

Thus, from a total of 20 schools in which first-year Gregg Shorthand, Diamond Jubilee, was taught, 10 schools were used for the collection of the data.

**Preparation of Dictation Material**

In order to examine the progress made by students in the Forkner Alphabet and Gregg (Diamond Jubilee) shorthand
systems during the second semester, three different sets of dictation material, each set containing 6 letters constructed from actual business letters, were used for gathering the data. A copy of each letter used in each of the three sets of dictation material is given in Appendix C.

Actual business letters with revisions were used in each set of dictation material. The following criteria were used in revising the business letters:

1. Length - 3 minutes;
2. Sets - 6 letters in each of three sets, one letter being at each of the following speeds: 50, 60, 70, 80, 90, and 100 words a minute;
3. Syllable intensity - 1.4;
4. Word frequency level - 65 per cent of the words from the 200 most frequently used words on the Silverthorn word list.

The Winter study showed that approximately 93 per cent of the business letters analyzed were less than four minutes in length.\(^1\) Therefore, three minutes for the length of each letter were used in the study.

All ranges of speeds feasible for the first-year shorthand course were desired. Therefore, the speeds of 50, 60, 70, 80, 90, and 100 words a minute were used. The

\(^{1}\)H. Jeannette Winter, "An Investigation of the Speeds of Dictation in Business Offices."
authors of the Gregg Shorthand system indicate that the students should be able to take dictation of new material at the end of the first year at the rate of 60 to 80 words a minute.2 The author of Forkner Alphabet Shorthand states that students learning the Forkner System can learn the system in half the time needed for traditional systems.3 Therefore, higher speeds than 80 words a minute should be possible by the Forkner students. Winter also showed that the average speed of dictation of business letters was approximately 80 words a minute and that a speed of 100 words a minute was needed to take most of the dictation given in the average office.4 From the Winter study, 100 words a minute would appear to meet the vocational requirements of business offices.

Since 1931, syllable intensity has been used to determine the difficulty of dictation material.5 The standard word of 1.4 syllables has been used as the average difficulty measure. Material with a higher or lower syllable intensity is considered to be "harder" or "easier." The 1.4 syllable intensity was therefore used as a measure.

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3This is Forkner Shorthand (New York: Forkner Publishing Company, Undated), 3.
4Winter, op. cit., 33.
of difficulty of the letters in each set of dictation material. Each letter used in the three sets of dictation material had a syllable intensity of approximately 1.4.

In a series of two articles appearing in the Business Education World, Millenger suggested another method of measuring the difficulty of dictation material by using the word frequency index based upon the Silverthorn word list. He suggested that since the 200 most frequently used words on the Silverthorn list accounted for 60 per cent of the 300,000 words encountered in the Silverthorn study, the 60 per cent figure could be projected to words occurring in any business correspondence. Therefore, he suggested that a letter could be called "average," meaning average difficulty, if 60 to 69 per cent of its vocabulary consisted of words in the 1-200 word category, and that an easy letter would be one that had 70 per cent or more of its words from the 1-200 category. As an additional check on the difficulty of the dictation material, 65 per cent of the words in each letter of the three sets of dictation material were from the 200 most frequently used words on the Silverthorn word list.

After each set of six letters had been constructed, three persons examined the letters for meaning and thought.

Revisions were made based upon the suggestions made by these persons. The letters were then dictated to a first-year college shorthand class for trial purposes. Additional revisions were made if needed after the shorthand transcripts were examined.

The dictation material was further analyzed to determine the percentage of Gregg brief forms and Forkner abbreviated words in each letter. The results from this analysis showed that approximately the same percentage of brief forms and abbreviated words were used in each letter.

As shown in Table 1, the percentage of Forkner abbreviated words in the first set of dictation material ranged from 41 to 49; and the percentage of Gregg brief forms ranged from 41 to 47.

**TABLE 1**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Total Words</th>
<th>Forkner Abbreviated Words</th>
<th>Gregg Brief Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>Per Cent</td>
</tr>
<tr>
<td>50</td>
<td>147</td>
<td>63</td>
<td>43</td>
</tr>
<tr>
<td>60</td>
<td>179</td>
<td>76</td>
<td>42</td>
</tr>
<tr>
<td>70</td>
<td>209</td>
<td>87</td>
<td>42</td>
</tr>
<tr>
<td>80</td>
<td>234</td>
<td>96</td>
<td>41</td>
</tr>
<tr>
<td>90</td>
<td>269</td>
<td>132</td>
<td>49</td>
</tr>
<tr>
<td>100</td>
<td>298</td>
<td>131</td>
<td>44</td>
</tr>
</tbody>
</table>
As shown in Table 2, the percentage of Forkner abbreviated words in the second set of dictation material ranged from 36 to 48; and the percentage of Gregg brief forms ranged from 35 to 46.

<table>
<thead>
<tr>
<th>Speed</th>
<th>Total Words</th>
<th>Forkner No.</th>
<th>Forkner Per Cent</th>
<th>Gregg No.</th>
<th>Gregg Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>152</td>
<td>65</td>
<td>43</td>
<td>64</td>
<td>42</td>
</tr>
<tr>
<td>60</td>
<td>178</td>
<td>85</td>
<td>48</td>
<td>82</td>
<td>46</td>
</tr>
<tr>
<td>70</td>
<td>207</td>
<td>94</td>
<td>45</td>
<td>92</td>
<td>44</td>
</tr>
<tr>
<td>80</td>
<td>240</td>
<td>86</td>
<td>36</td>
<td>84</td>
<td>35</td>
</tr>
<tr>
<td>90</td>
<td>266</td>
<td>121</td>
<td>46</td>
<td>114</td>
<td>43</td>
</tr>
<tr>
<td>100</td>
<td>293</td>
<td>135</td>
<td>46</td>
<td>122</td>
<td>42</td>
</tr>
</tbody>
</table>

As shown in Table 3, the percentage of Forkner abbreviated words in the third set of dictation material ranged from 36 to 47; and the percentage of Gregg brief forms ranged from 38 to 47.

<table>
<thead>
<tr>
<th>Speed</th>
<th>Total Words</th>
<th>Forkner No.</th>
<th>Forkner Per Cent</th>
<th>Gregg No.</th>
<th>Gregg Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>149</td>
<td>53</td>
<td>36</td>
<td>68</td>
<td>46</td>
</tr>
<tr>
<td>60</td>
<td>177</td>
<td>68</td>
<td>38</td>
<td>68</td>
<td>38</td>
</tr>
<tr>
<td>70</td>
<td>205</td>
<td>97</td>
<td>47</td>
<td>97</td>
<td>47</td>
</tr>
<tr>
<td>80</td>
<td>235</td>
<td>103</td>
<td>44</td>
<td>110</td>
<td>47</td>
</tr>
<tr>
<td>90</td>
<td>267</td>
<td>119</td>
<td>45</td>
<td>111</td>
<td>42</td>
</tr>
<tr>
<td>100</td>
<td>295</td>
<td>138</td>
<td>47</td>
<td>132</td>
<td>45</td>
</tr>
</tbody>
</table>
From this analysis, the content of dictation material, as far as brief forms and abbreviated words are concerned, did not favor one system over the other. Approximately the same percentage of words in each letter were represented by Gregg brief forms and Forkner abbreviated words.

A script of the directions and procedures to be used in presenting the dictation to the students was prepared. A copy is included in Appendix D. Since uniformity in the method of dictation was desired, the directions and the dictation letters were then recorded on a master tape. From the master tape, copies of each set of material were reproduced in order that each participating teacher could give the dictation to his students at the same time.

Procedures for Dictation of Material

The specific procedures to be used by each teacher for the dictation and transcription of each set of dictation materials were prepared and duplicated. A copy of the procedures and instructions is included in Appendix D. Also included in Appendix D are copies of the accompanying letter and a form for indicating the timing of each letter. A complete set of materials was sent to the participating teachers at five-week intervals during the second semester.
The first set of dictation material was given on March 3 and 4. The letters at speeds of 50, 60, and 70 words a minute were given on the first day; and the letters at speeds of 80, 90, and 100 words a minute were given on the second day. On each day, 30 minutes were allowed for transcription, which was in longhand.

Because of suggestions made by the teachers after the completion of the first set of dictation material, the procedures for Sets II and III were modified. For the last two sets of dictation material, three days were used for the dictation and transcription of the material instead of two. On the first day in Sets II and III, letters at speeds of 50 and 100 words a minute were given; on the second day, letters at speeds of 60 and 90 words a minute were given; and on the third day, letters at speeds of 70 and 80 words a minute were given. This provided the same amount of material to be dictated and transcribed each day. Thirty minutes were allowed each day for transcription, which was in longhand. This provided a minimum transcription rate of 15 words a minute.

The days of April 6, 7, and 8 were specified for Set II to be given, and May 11, 12, and 13 were specified for Set III. Five weeks lapsed between the dictation and transcription of each set of dictation material. The specified days indicated for the dictation and transcription was not possible in a few instances because of unavoidable
circumstances such as assemblies and shortening of class periods. In these special cases, however, the set of material was completed within a week of the specified days.

Because of the variety of tape recorders used by the participating teachers in both systems of shorthand, timing of the playing of the dictation was necessary to insure that the speed of dictation was correct. Each teacher timed each letter beginning with the salutation and ending with the complimentary close while the students took the dictation. The time required for the playing of each letter was recorded on a card with spaces for recording the time in minutes and seconds.

The results of this timing showed that each letter was played at the proper speed or within a few seconds of the official timing of the letter. Deviations from the official timing of the letters were within a 3- to 4-second interval. Because the deviations were very minor, dictation at the appropriate speed was assumed to be correct.

All transcripts were returned to the writer as soon as each set was completed.

**Method of Checking Transcripts**

In order to facilitate the checking process, each letter was duplicated with each word divided into syllables. Transcripts of students from a school not used in the study were used to establish the procedure for checking
each letter. Words which were trouble spots were identified and correctness of transcripts were determined.

The student's name was written on a blank line at the top of the duplicated copy. Then the transcript of each student was compared with the duplicated copy of the letter, and all omissions and incorrectly transcribed words were circled on the duplicated copy.

Spelling, punctuation, and paragraphing were not considered in the marking of incorrectly transcribed words. For example, the word peice was considered correctly transcribed for the word piece. Other examples of words counted as correctly transcribed were the following: efficent for efficient; sincerely for sincerely; and recieve for receive.

Symbol signs for words such as dollars, number, and per cent were counted as correctly transcribed. Shorthand outlines written in the transcripts were counted as incorrectly transcribed, with the exception of the dollar sign which is a brief form in the Forkner Shorthand System.

In isolated cases, two words were transposed. If the meaning was not changed, the transposition was counted as correctly transcribed.

Substitutions of words such as you for your, of for for, have for has, and is for his were counted as incorrectly transcribed.
Insertion of extra words were indicated on the duplicated copy but were not considered in determining the words correctly transcribed for each letter by each student. In nearly all cases where additional words were inserted, other parts of the sentence were omitted or incorrectly transcribed. Since the same number of syllables in each letter was desired for comparative purposes, the total number of syllables in the original letter was used.

In addition to the above, certain words were encountered which did not fit into any of the above categories. These words were those which deviated from the original letter. In order to determine word deviations which were to be counted as correctly transcribed, papers from one school which was not used in the analysis were checked first. The following criteria were established in marking word deviations as correctly transcribed:

1. The deviation did not affect the number of syllables in the original word;
2. The deviation did not result in the change of another word in the sentence;
3. The deviation did not completely change the meaning of the sentence.

The following are illustrations of "correctly transcribed words," which were deviations from the original letter: The last word in one letter was welcomed. Several students transcribed the word as welcome. This deviation by the omission of the d did not affect the number of
syllables in the original word, did not result in the change of another word in the sentence, and did not change the meaning of the sentence. Therefore, the word welcome was counted as correctly transcribed.

The omission of an s from the plural form of a word or the addition of an s to the singular form of a word was another example of a word deviation. In one letter, the word deviations was dictated. Some students transcribed the word as deviation. Omitting the s did not change the number of syllables in the original word, did not result in the change of another word in the sentence, and did not change the meaning of the sentence. The word deviations was preceded by the word any. Therefore, the word deviation was counted as correctly transcribed. A word such as services transcribed for the word service, however, was counted as incorrectly transcribed since an extra syllable was added with the addition of the s.

After the transcripts had been checked and all omissions and incorrectly transcribed words indicated on the duplicated copy, the total number of syllables in the incorrectly transcribed or omitted words in each letter was determined and written at the bottom of the page. This total number of syllables was then subtracted from the total number of syllables contained in the original letter and then divided by 1.4. This provided the number of standard words correctly transcribed by each student for each letter.
The number of standard words correctly transcribed by each student for each letter was used as the dependent variable in the analysis of the data which is given in Chapter V.

Selection of Random Sample for Statistical Treatment

The Analysis of Variance was used as the statistical treatment of the data and is presented in Chapter V.

A total of 251 students was enrolled in the 8 schools which used Forkner Alphabet Shorthand, and a total of 315 students was enrolled in the 10 schools which used Gregg Shorthand, Diamond Jubilee. Not all students were used for analysis purposes. The papers of those students who had studied another system of shorthand, were repeating the shorthand course, or for whom there was no grade point average were eliminated before the random sample was selected. The papers of 17 Forkner students and 13 Gregg students were eliminated. Thus, a total of 234 Forkner students and 302 Gregg students were used for analysis purposes.

In order to obtain a random sample from the papers of the two groups, a table of random numbers was used in selecting the sample.\(^7\) Since grade-point average was used

as a factor in the statistical treatment of the data, all grade-point averages were converted to a 4-point scale if a different scale had been used.

The student information forms, which contained the grade-point average and the name of each student, were grouped according to school for each shorthand system. The student information forms were then sub-divided according to the three levels of grade-point average used in the study — Above-Average Achievers (3.00 and above); Average Achievers (2.00 to 2.99); and Below-Average Achievers (1.99 and below). Numbers were obtained from the table of random numbers. A paper was taken from the stack of papers of a school corresponding to that number. A student's paper was then selected at random from those in that group. The transcripts of each of the students selected at random were used for each of the speeds for a particular set of dictation material. In cases where a student who had been selected was absent during one of the days of dictation and transcription of a set of material, another name was drawn at random and his papers were replaced.

For example, for Set I, the names of 10 students were selected at random for the classification Average Achievers for the Gregg group. This procedure was repeated for the classifications of Above-Average Achievers and Below-Average Achievers for the Gregg group. The same
procedure was repeated for the Forkner group for Set I. For Set II and Set III, the entire process was repeated until all papers for the random sample had been selected.

After the sample of transcripts had been selected and checked, the data were punched on IBM cards for statistical treatment. The statistical treatment and analysis of the data are presented in Chapter V.
CHAPTER IV

COMPARISON OF SCHOOLS, TEACHERS, AND STUDENTS

Because of the number of schools used in the study, background information about the schools, the teachers, and the students was collected by means of two information forms, which were completed by the teachers and the students. Copies of these forms are given in Appendix B.

Schools

Eight schools in which Forkner Alphabet Shorthand was taught and ten schools in which Gregg Shorthand, Diamond Jubilee, was taught were used in the collection of the data. Information concerning the following background factors was gathered for each school: (1) high school enrollment; (2) time of day that class met; (3) length of class meeting each day in minutes; (4) number of class meetings each week; (5) beginning date of the second semester; (6) primary purpose of the shorthand course; and (7) length of shorthand course in semesters.

The length of the shorthand course for all schools, both Forkner and Gregg, was two semesters; and each class met five times a week for both shorthand systems. For all
schools, the primary purpose of the shorthand course was vocational.

The two groups of schools used in the study were relatively comparable in size of population, as shown in these results:

<table>
<thead>
<tr>
<th>Forkner Schools</th>
<th>Gregg Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,400</td>
<td>1,900</td>
</tr>
<tr>
<td>1,400</td>
<td>1,800</td>
</tr>
<tr>
<td>1,200</td>
<td>1,785</td>
</tr>
<tr>
<td>1,039</td>
<td>1,704</td>
</tr>
<tr>
<td>1,000</td>
<td>1,033</td>
</tr>
<tr>
<td>765</td>
<td>950</td>
</tr>
<tr>
<td>100</td>
<td>750</td>
</tr>
<tr>
<td>78</td>
<td>732</td>
</tr>
<tr>
<td></td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

The mean enrollment for the Forkner schools was 998 and the mean enrollment for the Gregg schools was 1,125. Both groups had schools of considerable size and also schools of relatively small size. Therefore, the size of school should not favor one shorthand system over the other.

Classes for both systems of shorthand were distributed throughout the morning as well as the afternoon, as shown in the following results:

<table>
<thead>
<tr>
<th>Forkner Schools</th>
<th>Gregg Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>8:15 a.m.</td>
</tr>
<tr>
<td>8:15 a.m.</td>
<td>8:50 a.m.</td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td>9:00 a.m.</td>
</tr>
<tr>
<td>9:43 a.m.</td>
<td>9:30 a.m.</td>
</tr>
<tr>
<td>9:50 a.m.</td>
<td>10:45 a.m.</td>
</tr>
<tr>
<td>10:42 a.m.</td>
<td>12:25 p.m.</td>
</tr>
<tr>
<td>11:35 a.m.</td>
<td>12:25 p.m.</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>12:27 p.m.</td>
</tr>
<tr>
<td>1:16 p.m.</td>
<td>1:00 p.m.</td>
</tr>
</tbody>
</table>
Since both groups had classes during the morning and afternoon, the results obtained from the study should not favor one system over the other.

The length of time devoted to the study of shorthand could have some effect upon the achievement of the students. Therefore, the amount of time spent in class and a sample of time spent on homework was obtained. The mean length of time for the class period for the Forkner schools was 56 minutes a day; for the Gregg schools, 52 minutes a day. This difference of time spent in class each day by each group was not so great that the results of the study would favor one system over the other. Of the 8 Forkner schools, 4 had a class period of 55 minutes. Of the 10 Gregg schools, 5 had a class period of 55 minutes. Therefore, the time spent in class by both groups was very similar.

During one week of the second semester, each student enrolled in one of the shorthand classes used in the study kept a daily record of time spent on homework for one week. The students did not place their names on the form provided for recording the time. The Forkner students spent an
average of 30 minutes a day on their homework, and the Gregg students spent an average of 45 minutes a day on their homework. The time spent on homework was in favor of the Gregg students and could account for differences in the achievement of the students in the two groups.

Various schools throughout the United States were used for the collection of the data. The geographic location of the 8 Forkner schools was as follows: 2 each in Iowa, Minnesota, and Washington; and one each in California and Michigan. The geographic location of the 10 Gregg schools was as follows: 4 in North Carolina; 3 in Ohio; 2 in Missouri; and one in Colorado. Because of the geographic distribution of the schools, the beginning date of the second semester was obtained. The beginning dates of the second semester for the schools were as follows:

<table>
<thead>
<tr>
<th>Forkner Schools</th>
<th>Gregg Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 17</td>
<td>January 14</td>
</tr>
<tr>
<td>January 24</td>
<td>January 17</td>
</tr>
<tr>
<td>January 24</td>
<td>January 17</td>
</tr>
<tr>
<td>January 24</td>
<td>January 24</td>
</tr>
<tr>
<td>January 25</td>
<td>January 24</td>
</tr>
<tr>
<td>January 27</td>
<td>January 24</td>
</tr>
<tr>
<td>January 31</td>
<td>January 26</td>
</tr>
<tr>
<td>February 3</td>
<td>January 31</td>
</tr>
<tr>
<td></td>
<td>February 3</td>
</tr>
<tr>
<td></td>
<td>February 8</td>
</tr>
</tbody>
</table>

Each of three sets of dictation material was given at five-week intervals during the second semester. Because there were schools in both shorthand systems which began the semester at approximately the same time, the length of
time lapsed from the beginning of the semester to the time the dictation sets were given should not favor one system of shorthand over the other.

The background factors presented in the preceding paragraphs, except the amount of time spent on homework which favored the Gregg schools, indicate that the two groups representing the two systems of shorthand were relatively comparable.

**Teachers**

The teacher does have an effect upon the achievement of the students; however, controlling the method of teaching of each teacher and other teacher factors was not possible. Eight Forkner Shorthand teachers and 10 Gregg Shorthand teachers were used in the study in order to decrease the effect of any one teacher. Information concerning the following background factors was obtained for each participating teacher: (1) years of shorthand teaching experience; (2) years of teaching experience in the system being taught during the study; (3) months of educational training in system taught and how received; (4) name of any other shorthand system which had been taught; (5) shorthand system which was preferred; and (6) degree or degrees held.
The teachers in the two groups were relatively comparable in the number of years of prior shorthand teaching experience, as shown in these results:

<table>
<thead>
<tr>
<th>Forkner Teachers</th>
<th>Gregg Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 years</td>
<td>20 years</td>
</tr>
<tr>
<td>6 years</td>
<td>10 years</td>
</tr>
<tr>
<td>6 years</td>
<td>9 years</td>
</tr>
<tr>
<td>3 years</td>
<td>5 years</td>
</tr>
<tr>
<td>3 years</td>
<td>4 years</td>
</tr>
<tr>
<td>2 years</td>
<td>4 years</td>
</tr>
<tr>
<td>2 years</td>
<td>3 years</td>
</tr>
<tr>
<td>0 years</td>
<td>3 years</td>
</tr>
</tbody>
</table>

The mean number of years of shorthand teaching experience for both groups was six. Both groups had one teacher who was teaching shorthand for the first year. Because of the similarity of shorthand teaching experience of the two groups, this factor should not favor one system over the other.

The years of teaching experience in the system taught during the study differed for the two groups, as shown in the following results:

<table>
<thead>
<tr>
<th>Forkner Teachers</th>
<th>Gregg Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>20 years</td>
</tr>
<tr>
<td>2 years</td>
<td>10 years</td>
</tr>
<tr>
<td>2 years</td>
<td>9 years</td>
</tr>
<tr>
<td>1 year</td>
<td>5 years</td>
</tr>
<tr>
<td>1 year</td>
<td>4 years</td>
</tr>
<tr>
<td>2 months</td>
<td>4 years</td>
</tr>
<tr>
<td>0 years</td>
<td>3 years</td>
</tr>
<tr>
<td>0 years</td>
<td>3 years</td>
</tr>
</tbody>
</table>

The mean number of years of teaching experience in the system
taught during the study was one year for the Forkner group and six years for the Gregg group. The years of teaching experience in the system taught during the study was in favor of the Gregg teachers. However, with the exception of the three Gregg teachers with nine years or more of teaching experience in Gregg Shorthand, the other teachers were similar in the number of years of shorthand teaching experience in the system taught during the study. The difference in the two groups for this particular factor should not result in a marked difference in the achievement results of the students.

Educational training in the system taught during the study was considerably different for the two groups, as shown in the following results:

<table>
<thead>
<tr>
<th>Forkner Teachers</th>
<th>Gregg Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 months</td>
<td>24 months</td>
</tr>
<tr>
<td>4.5 months</td>
<td>20 months</td>
</tr>
<tr>
<td>3.0 months</td>
<td>18 months</td>
</tr>
<tr>
<td>1.0 month</td>
<td>18 months</td>
</tr>
<tr>
<td>0.0 month</td>
<td>17 months</td>
</tr>
<tr>
<td>0.0 month</td>
<td>15 months</td>
</tr>
<tr>
<td>0.0 month</td>
<td>9 months</td>
</tr>
<tr>
<td>0.0 month</td>
<td>9 months</td>
</tr>
</tbody>
</table>

For the 4 Forkner Teachers who had educational training in Forkner Shorthand, the mean months of training was 3. In addition to these 4, four other Forkner Teachers had no formal educational training in Forkner Shorthand. For the 10 Gregg Teachers, all of whom had educational training in
Gregg Shorthand, the mean months of training was 13. Three of the Forkner teachers indicated that they had received their educational training in the Forkner Short­hand through workshop, three indicated self-study, and two indicated course instruction. All of the 10 Gregg teachers indicated that they had received their educational training in Gregg Shorthand through course instruction. The length of time and method of receiving the educational training was in favor of the Gregg group.

Six of the Forkner teachers indicated that they had taught Gregg Shorthand; one indicated that he had taught machine shorthand; and one indicated that he had taught StenoScript. One of the Forkner teachers had not taught another system of shorthand and was teaching Forkner Shorthand for the first year. None of the Gregg teachers indicated that they had taught another system of shorthand.

In answering the question concerning the system of shorthand they preferred to teach, the Forkner teachers indicated the following:

<table>
<thead>
<tr>
<th>System Preferred</th>
<th>No. of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forkner</td>
<td>5</td>
</tr>
<tr>
<td>Gregg</td>
<td>1</td>
</tr>
<tr>
<td>Machine Shorthand</td>
<td>1</td>
</tr>
<tr>
<td>No preference</td>
<td>1</td>
</tr>
</tbody>
</table>

Since the Gregg teachers had not taught another system of shorthand, the system of shorthand they preferred to teach was Gregg. Preference of shorthand system could have an
effect upon the achievement of the students. Only two of the Forkner teachers indicated another system other than the one they were teaching as preferred.

Of the 8 Forkner teachers participating in the study, 6 had Bachelor's degrees and 2 had Master's degrees. Of the 10 Gregg teachers, 8 had Bachelor's degrees and 2 had Master's degrees. Both groups were comparable in regard to the kind of degrees held.

Of the 8 Forkner teachers, 5 were female and 3 were male. Of the 10 Gregg teachers, 7 were female and 3 were male. Since both sexes were represented in the two groups, this factor should not favor one system over the other.

The two groups were relatively comparable in the following background factors: number of years of teaching experience, degrees, and sex. The difference in the two groups for years of teaching experience in the system taught during the study was only slight and should not favor one shorthand system over the other. The educational training of the two groups in the system taught during the study differed considerably and was in favor of the Gregg group. The method and length of time spent in learning the system taught was in favor of the Gregg group.

Other teacher factors such as enthusiasm and personality which could affect achievement of students were not possible to determine. Based upon the background
factors discussed in the preceding paragraphs, the teachers in the two groups were relatively comparable, except for the educational training in the system taught which favored the Gregg teachers.

**Students**

Two hundred thirty-four students from 8 schools in which Forkner Shorthand was taught were used in the study; 302 students from 10 schools in which Gregg Shorthand, Diamond Jubilee, was taught were used in the study. Information concerning the following background factors was gathered for each of the students: (1) year of high school; (2) age; (3) sex; (4) reason for taking the shorthand course; (5) grade-point average for all classes in grades 9 and 10; and (6) an indication that the shorthand course was being taken for the first time.

Tables 4 and 5 show that the Forkner group of students was slightly older than the Gregg group. As shown in Table 4, 61 per cent of the Forkner students and 26 per cent of the Gregg students were in Grade 12.

As shown in Table 5, 65 per cent of the Forkner students and 34 per cent of the Gregg students were 17 years of age; 26 per cent of the Forkner and 56 per cent of the Gregg students were 16 years of age; and 9 to 10 per cent of the students in each group were 18 years of age.
TABLE 4
YEAR IN HIGH SCHOOL OF STUDENTS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Forkner No.</th>
<th>Forkner Per Cent</th>
<th>Gregg No.</th>
<th>Gregg Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>92</td>
<td>39</td>
<td>222</td>
<td>74</td>
</tr>
<tr>
<td>12</td>
<td>142</td>
<td>61</td>
<td>80</td>
<td>26</td>
</tr>
<tr>
<td>Totals</td>
<td>234</td>
<td>100</td>
<td>302</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE 5
AGE OF STUDENTS

<table>
<thead>
<tr>
<th>Age</th>
<th>Forkner No.</th>
<th>Forkner Per Cent</th>
<th>Gregg No.</th>
<th>Gregg Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>61</td>
<td>26</td>
<td>168</td>
<td>56</td>
</tr>
<tr>
<td>17</td>
<td>153</td>
<td>65</td>
<td>104</td>
<td>34</td>
</tr>
<tr>
<td>18 &amp; over</td>
<td>20</td>
<td>9</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Totals</td>
<td>234</td>
<td>100</td>
<td>302</td>
<td>100</td>
</tr>
</tbody>
</table>

Of the total number of students in each group, 1 per cent was male and 99 per cent was female.

As shown in Table 6, the majority of students in both systems indicated a vocational reason for taking the shorthand course, with 61 per cent of the Forkner students and 76 per cent of the Gregg students so indicating. Personal use was indicated by 30 per cent of the Forkner students and by 15 per cent of the Gregg students. Of the
students in each group, 9 per cent indicated other reasons such as both vocational and personal reasons for taking the shorthand course.

TABLE 6

REASON FOR TAKING SHORTHAND OF STUDENTS

<table>
<thead>
<tr>
<th>Reason</th>
<th>Forkner No.</th>
<th>Per Cent</th>
<th>Gregg No.</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal-use</td>
<td>70</td>
<td>30</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>Vocational</td>
<td>144</td>
<td>61</td>
<td>228</td>
<td>76</td>
</tr>
<tr>
<td>Other</td>
<td>20</td>
<td>9</td>
<td>29</td>
<td>9</td>
</tr>
<tr>
<td>Totals</td>
<td>234</td>
<td>100</td>
<td>302</td>
<td>100</td>
</tr>
</tbody>
</table>

As shown in Table 7, 13 per cent of the Forkner students and 24 per cent of the Gregg students were classified as Above-Average Achievers; 57 per cent of the Forkner students and 54 per cent of the Gregg students were classified as Average Achievers; and 30 per cent of the Forkner students and 22 per cent of the Gregg students were classified as Below-Average Achievers.

The students in the two groups were relatively comparable except for the age and grade level which is in favor of the Forkner group. The other background factors indicate that no great difference exists between the two groups. Grade-point average was used in the following chapter for statistical purposes.
<table>
<thead>
<tr>
<th>Grade-Point Average</th>
<th>Forkner No.</th>
<th>Forkner Per Cent</th>
<th>Gregg No.</th>
<th>Gregg Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00-4.00</td>
<td>30</td>
<td>13</td>
<td>73</td>
<td>24</td>
</tr>
<tr>
<td>2.00-2.99</td>
<td>133</td>
<td>57</td>
<td>164</td>
<td>54</td>
</tr>
<tr>
<td>0.00-1.99</td>
<td>71</td>
<td>30</td>
<td>65</td>
<td>22</td>
</tr>
<tr>
<td>Totals</td>
<td>234</td>
<td>100</td>
<td>302</td>
<td>100</td>
</tr>
</tbody>
</table>
CHAPTER V

ANALYSIS AND INTERPRETATION OF THE DATA

The data collected during the course of the experiment were processed by means of an analysis of variance program\(^1\) for replicated designs which was written by J. C. Naylor and Carol Estep, Laboratory of Aviation Psychology, The Ohio State University. The IBM 7094 system at The Ohio State University Computer Center was used in processing the data.

The analysis of variance program contained provisions for determining whether there were relationships between the independent and dependent variables of a set of observations. In addition, information was provided on the interactive effects of the independent variables upon the dependent variables. The program was designed to provide simultaneously the sums of squares, the degrees of freedom, and the mean squares for two different types of analyses. The repeated measures design, where there were \(n\) subjects/groups and where each subject experienced several treatment combinations, was used in the

---

\(^1\)The program used in the statistical treatment was designed for five factors; only four factors were used in the study.
statistical treatment of the data. The repeated measures design used in the study is presented in Figure 1. The four factors designated as the independent variables were as follows:

- **Speed** (6 levels - 50, 60, 70, 80, 90, 100)
- **Grade-Point Average** (3 levels - Above-Average Achievers, Average Achievers, Below-Average Achievers)
- **System** (2 levels - Forkner Alphabet Shorthand, Gregg Shorthand)
- **Set** (3 levels - Set I, Set II, Set III)

<table>
<thead>
<tr>
<th>Set</th>
<th>System</th>
<th>Grade-Point Average</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>Forkner</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gregg</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Forkner</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gregg</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Forkner</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gregg</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1. Repeated Measures Design for Analysis of Variance.*
The dependent variable was designated as the standard words correctly transcribed on each letter. The standard words correctly transcribed is used in the following discussions as the indication of the achievement of the two groups.

The number of students participating in the experiment was 536 - 234 students in the Forkner group and 302 in the Gregg group. A random sample of 10 students in each grade-point average level in each system for each set of dictation material was selected. Thus, 180 observations were made on the data concerning the four independent variables and the dependent variable. These observations, together with appropriate student identification, were punched on IBM cards.

In order to analyze the results of the study, answers were sought to the following specific questions:

1. Do students in one shorthand system achieve better than in the other?
2. Do students in each shorthand system achieve differently at each speed level?
3. Do students in each shorthand system achieve differently in each grade-point average level?
4. Do students in each shorthand system achieve differently in each set of dictation?
5. Do students in each shorthand system achieve differently at each speed level in each grade-point average level?
6. Do students in each shorthand system achieve differently at each speed level in each set of dictation?

7. Do students in each shorthand system achieve differently in each grade-point average level in each set of dictation?

8. Do students in each shorthand system achieve differently at each speed level in each grade-point average level in each set of dictation?

The analysis and interpretation resulting from the statistical treatment of the data are explained in the following paragraphs. The discussion is divided into two major parts: main effects and interactive effects. The interactive effects are subdivided for discussion purposes. The complete data for this chapter are given in Appendix E.

Main Effects

The main effects of the two systems of shorthand are presented in Table 8. The F-ratio for system was 66.63, which was highly significant at the .05 level of confidence. This highly significant difference in system indicated that students in one system achieved higher than in the other system. As shown in Figure 2, the significant difference was in favor of the Forkner group.

Table 8 also shows that there were no significant differences in the interactive effects of the independent variables and the dependent variable. The two systems
differed significantly in favor of the Forkner group no matter what the speed, grade-point average, or set of dictation.

**TABLE 8**

**SIGNIFICANCE OF DIFFERENCE ON MAIN EFFECTS AND INTERACTIVE EFFECTS AT THE .05 LEVEL OF CONFIDENCE**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Degrees of Freedom</th>
<th>F-ratio</th>
<th>Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>1</td>
<td>66.63(^{a})</td>
<td>Yes</td>
</tr>
<tr>
<td>System-speed</td>
<td>5</td>
<td>1.23(^{b})</td>
<td>No</td>
</tr>
<tr>
<td>System-GPA(^{c})</td>
<td>2</td>
<td>2.08(^{d})</td>
<td>No</td>
</tr>
<tr>
<td>System-set</td>
<td>2</td>
<td>1.86(^{d})</td>
<td>No</td>
</tr>
<tr>
<td>System-GPA-speed</td>
<td>10</td>
<td>.62(^{e})</td>
<td>No</td>
</tr>
<tr>
<td>System-speed-set</td>
<td>10</td>
<td>1.09(^{e})</td>
<td>No</td>
</tr>
<tr>
<td>System-GPA-set</td>
<td>4</td>
<td>.38(^{f})</td>
<td>No</td>
</tr>
<tr>
<td>System-GPA-speed-set</td>
<td>20</td>
<td>.43(^{g})</td>
<td>No</td>
</tr>
</tbody>
</table>

\(^{a}\)Significant at the level of 3.85
\(^{b}\)Significant at the level of 2.22
\(^{d}\)Significant at the level of 3.00
\(^{e}\)Significant at the level of 1.84
\(^{f}\)Significant at the level of 2.38
\(^{g}\)Significant at the level of 1.58
\(^{c}\)Grade-point average

The following discussion of the interactive effects presents a more detailed analysis of the achievement of the students in both groups for the various interactive effects of the independent variables on the dependent variable.
Figure 2. Mean Achievement of Forkner and Gregg Groups.
Interactive Effects

In addition to the comparison of the main effects of the system, the analysis of variance used in the statistical treatment of the data provided information concerning the following interactive effects: system with speed; system with grade-point average; system with set of dictation; system with grade-point average and speed; system with speed and set of dictation; system with grade-point average and set; and system with speed, set of dictation, and grade-point average.

System-speed

As shown in Table 8, there was no significant difference in the interactive effects of system-speed and achievement, which indicated that there was no relation between speed-system and achievement. For example, the Forkner group did not achieve significantly higher at the speed of 70 while the Gregg group achieved significantly higher at the speed of 80.

Figure 3 presents a graphic picture of the achievement of the Forkner and Gregg groups at each speed. The Forkner group achieved higher than the Gregg group at each level of speed. At the speed of 70 and higher, both groups decreased in the number of standard words correctly transcribed. The Forkner group, however, did not decrease
Figure 3. Mean Achievement of Forkner and Gregg Groups at Each Speed Level.
as rapidly between the speeds of 60 and 70 as the Gregg group. The Gregg group achieved the same at the speeds of 70 and 80.

**System-GPA**

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-GPA and achievement, which indicated that there was no relation between system-GPA and achievement. For example, the Forkner Above-Average Achievers did not achieve higher than the Gregg Above-Average Achievers while the Gregg Average Achievers achieved higher than the Forkner Average Achievers.

Figure 4 presents a graphic picture of the achievement of the Forkner and Gregg groups for each grade-point average level. At each grade-point average level, the Forkner group achieved higher than the Gregg group. Figure 4 also shows that the Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers; and that the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers.

**System-set**

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-set and achievement, which indicated that there was no relation between system-set and achievement. For
Figure 4. Mean Achievement of Forkner and Gregg Groups by Grade-Point Average.
example, the Forkner group did not achieve significantly higher in Set I while the Gregg group achieved significantly higher in Set II.

Figure 5 presents a graphic picture of the achievement of the Forkner and Gregg groups in each set of dictation. In each of the three sets of dictation, the Forkner group achieved higher than the Gregg group. The Gregg group increased more rapidly than the Forkner group from Set I to Set II. However, the Forkner group showed a sharper increase than the Gregg group from Set II to Set III.

**System-GPA-speed**

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-GPA-speed and achievement, which indicated that there was no relation between system-GPA-set and achievement. For example, the Forkner Above-Average Achievers did not achieve significantly higher at the speed of 70 while the Gregg Above-Average Achievers achieved significantly higher at the speed of 80.

Figure 6 presents a graphic picture of the achievement of the Forkner and Gregg groups in each grade-point average level at each speed level. The Forkner group achieved higher than the Gregg group in each grade-point average level at each speed level. The Forkner Average
Figure 5. Mean Achievement of Forkner and Gregg Groups by Sets of Dictation.
Figure 6. Mean Achievement of Forkner and Gregg Groups by Grade-Point Average and Speed.
Achievers achieved higher than the Gregg Above-Average Achievers at each speed level, except for the speeds of 90 and 100. The Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers at each speed level, except for the speeds of 80 and 100. The Forkner Below-Average Achievers achieved higher than the Gregg Above-Average Achievers at the speed of 50.

For the Below-Average Achievers, the number of correct standard words transcribed decreased for both the Forkner and Gregg groups after the speed of 60. For the Average Achievers, the number of standard words correctly transcribed decreased for both the Forkner and Gregg groups after the speed of 80. For the Above-Average Achievers, the Forkner group decreased in the number of standard words correctly transcribed after the speed of 80; the Gregg group decreased after the speed of 60 but increased between the speeds of 70 and 80 and then decreased at the speeds of 90 and 100. The difference in achievement of the Forkner and Gregg groups was greatest for the Average Achievers.

**System-speed-set**

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-speed-set and achievement, which indicated that there was no relation between system-speed-set and
achievement. For example, the Forkner group did not achieve significantly higher at the speed of 80 in Set I while the Gregg group achieved significantly higher at the speed of 60 in Set I.

Figures 7 and 8 present a graphic picture of the achievement of the Forkner and Gregg groups at each speed level in each set of dictation. The Forkner group achieved higher than the Gregg group at each speed level in each set of dictation. Both groups increased the number of standard words correctly transcribed at each speed level from Set I to Set II and from Set II to Set III, except for the following: Forkner, speed of 80 from Set I to Set II and speed of 50 from Set II to Set III; Gregg, speed of 50 from Set II to Set III. The transcripts of each group was examined for patterns of errors which might have provided a possible explanation. No patterns of errors were found, however. Therefore, the decrease in achievement for these groups was unexplainable. The low achievement in Set I for the speeds of 70 and 100 for both groups seemed to substantiate the belief of several participating teachers that the amount of time allowed for transcription in Set I was not sufficient. As a result of these comments, the procedures for Sets II and III were revised so that sufficient time was allowed for transcription. The results of Sets II and III for the speeds of 70 and 100 indicate a better picture of the achievement of the students in both groups.
Figure 7. Mean Achievement of Forkner and Gregg Groups at the Speeds of 50, 60, and 70 by Set.
Figure 8. Mean Achievement of Forkner and Gregg Groups at the Speeds of 80, 90, and 100 by Set.
From Set I to Set II at the speeds of 50, 60, and 70, the increase in the number of standard words correctly transcribed by the Gregg group was greater than the Forkner group. Also, from Set II to Set III at the speed of 60, the increase of the Gregg group was greater than the Forkner group although the difference was only one standard word.

From Set I to Set II and from Set II to Set III at the speeds of 80, 90, and 100, the increase in the number of standard words correctly transcribed by the Forkner group was greater than the Gregg group. In addition, from Set II to Set III at the speed of 70, the increase by the Forkner group was greater than the Gregg group although the difference was only two standard words.

System-GPA-set

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-GPA-set and achievement, which indicated that there was no relation between system-GPA-set and achievement. For example, the Gregg Above-Average Achievers did not achieve significantly higher than the Forkner Above-Average Achievers in Set I while the Forkner Above-Average Achievers achieved significantly higher than the Gregg Above-Average Achievers in Set II.

As shown in Figure 9, the Forkner Above-Average Achievers achieved higher than the Gregg Above-Average
Figure 9. Mean Achievement of Forkner and Gregg Groups by Grade-Point Average and Set.
Achievers in each set. Figure 9 also shows that the Forkner Average Achievers and the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers and Below-Average Achievers in each set.

In Sets I and III, the Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers. In Sets I and II, the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers.

For both groups, the Below-Average Achievers did not progress much between Sets II and III but seemed to reach a plateau. Although the increase in achievement for the Gregg Above-Average and Gregg Average Achievers was not as great between Sets II and III as for the Forkner Above-Average and Forkner Average Achievers, both groups increased from Set I to Set II and continued to progress from Set II to Set III.

System-GPA-speed-set

As shown in Table 8 on page 62, there was no significant difference in the interactive effects of system-GPA-speed-set and achievement, which indicated that there was no relation between system-GPA-speed-set and achievement. For example, the Gregg Above-Average Achievers did not achieve significantly higher than the Forkner Above-Average Achievers at the speed of 50 in Set I while the Forkner Above-Average Achievers achieved significantly
higher than the Gregg Above-Average Achievers at the speed of 50 in Set II.

Since the interactive effects of the four main factors were unwieldy to present in one graph, Figures 10 through 15 were used to present a graphic picture of the interactive effects of system-GPA-speed-set and achievement. The first three parts of the following discussion present a contrast of the two systems by corresponding grade-point average level; the final part presents additional comparisons of a summary nature.

**Above-average achievers.** The results of the interactive effects of system-grade point average-speed-set and achievement for the Above-Average Achievers are presented in Figures 10 and 11. The Forkner Above-Average Achievers achieved higher than the Gregg Above-Average Achievers at all speeds in each set, except for the speed of 60 in Set II and the speed of 100 in Set I. In these two instances, the Gregg Above-Average Achievers achieved higher than the Forkner Above-Average Achievers — a difference of one standard word at the speed of 60 in Set II and a difference of five standard words at the speed of 100 in Set I. The difference, however, was not significant.

The Forkner Above-Average Achievers decreased slightly at the speed of 60 from Set I to Set II, and at the speed of 50 from Set II to Set III. The transcripts for this group were examined to determine whether there were
Figure 10. Mean Achievement of Forkner and Gregg Above-Average Achievers at Speeds of 50, 60, and 70 in Each Set.
Figure 11. Mean Achievement of Forkner and Gregg Above-Average Achievers at Speeds of 80, 90, and 100 in Each Set.
patterns of errors which could have explained the decrease. No such patterns were found. The reason for the decrease in the number of standard words correctly transcribed was unexplainable.

The Forkner Above-Average Achievers increased more rapidly than the Gregg Above-Average Achievers from Set II to Set III at each speed level. The greatest difference in the achievement of the Forkner and Gregg Above-Average Achievers was at the speeds of 80, 90, and 100.

Except at the speed of 50 in Set III, the Gregg Above-Average Achievers increased in the number of standard words transcribed for each speed. They showed a more rapid gain from Set I to Set II at all speeds than from Set II to Set III, except for the speed of 90.

As shown in Figures 10 and 11, the increase in the number of words correctly transcribed was greater for the Forkner Above-Average Achievers than the Gregg Above-Average Achievers for the speeds of 80, 90, and 100 in Set III.

Average achievers. The results of the interactive effects of system-grade point average-speed-set and achievement for Forkner and Gregg Average Achievers are presented in Figures 12 and 13. The Forkner Average Achievers achieved higher than the Gregg Average Achievers at all speeds in each set. The greatest difference in achievement of the two groups was at speeds of 50, 60, and 70 in Set I and at speeds of 80, 90, and 100 in Set III. The difference
Figure 12. Mean Achievement of Forkner and Gregg Average Achievers at Speeds of 50, 60, and 70 in Each Set.
Figure 13. Mean Achievement of Forkner and Gregg Average Achievers at Speeds of 80, 90, and 100 in Each Set.
in the achievement of the two groups was less at speeds of 50 and 60 in Sets II and III than at any other speed in any set.

The Forkner Average Achievers decreased slightly in the standard words correctly transcribed at the speed of 50 in Set III. The sharp decrease of the Forkner Average Achievers at the speed of 80 in Set II and the less sharp decrease at the speed of 90 in Set II are unexplainable. An examination of the transcripts of these students did not reveal any patterns which might have explained these decreases in achievement. The sharp increase in achievement for the Forkner Average Achievers occurred at the speeds of 80, 90, and 100 in Set III.

The Gregg Average Achievers decreased slightly in the standard words correctly transcribed at the speed of 50 in Set III. Like the Forkner Average Achievers, the Gregg Average Achievers showed a sharp decrease at the speed of 90 in Set II. These decreases cannot be explained since there were no patterns established in the transcripts of these students which might have provided the answers. The Gregg Average Achievers showed the greatest increase at the speeds of 50, 60, 70, and 100 on Set II and at the speed of 90 in Set III. Not much change occurred at the speed of 80 in each set for the Gregg Average Achievers, although there was a slight increase in Set III.
Below-average achievers. The results of the interactive effects of system-grade point average-speed-set and achievement for the Forkner and Gregg Below-Average Achievers are presented in Figures 14 and 15. Except for the speed of 100 in Set I, the Forkner Below-Average Achievers achieved higher than the Gregg Below-Average Achievers at all speeds in each set. At the speed of 100 in Set I, the difference between the achievement of the two groups was slight. At speeds of 60, 70, and 100 in each set, both groups showed a continued increase in achievement. After the speed of 70, however, both groups showed a decline in the number of standard words correctly transcribed.

At the speed of 50 in Sets II and III, the achievement of the Forkner Below-Average Achievers was near the maximum possible at that speed. Both the Forkner and Gregg Below-Average Achievers achieved higher at the speeds of 50, 60, and 70 than at the speeds of 80, 90, and 100. The decrease in achievement at the speed of 50 in Set III for the Gregg Below-Average Achievers was unexplainable since there were no patterns in the transcripts which might have provided the answer. For the speeds of 60, 70, and 100, the Forkner and Gregg Below-Average Achievers showed a continued upward achievement. The achievement of the Forkner and Gregg Below-Average Achievers at the speeds of 80 and 90 decreased from Set II to Set III.
Figure 14. Mean Achievement of Forkner and Gregg Below-Average Achievers at Speeds of 50, 60, and 70 in Each Set.
Figure 15. Mean Achievement of Forkner and Gregg Below-Average Achievers at Speeds of 80, 90, and 100 in Each Set.
**Additional comparisons.** The Forkner Average Achievers achieved the same or higher than the Gregg Above-Average Achievers at each speed in each set except for the following: speed of 80 in Set II; speed of 90 in Sets I and II; and speed of 100 in Sets I and II.

The Forkner Below-Average Achievers achieved the same or higher than the Gregg Average Achievers at each speed in each set except for the following: speed of 80 in Sets II and III; speed of 90 in Sets I and III; and speed of 100 in Set III.

By comparing the preceding figures (10 to 15), the Forkner Above-Average Achievers achieved higher than the Forkner Average Achievers except for the following: speed of 60 in Sets II and III; and the Forkner Average Achievers achieved higher than the Forkner Below-Average Achievers except for the following: speed of 50 in Set III and speed of 90 in Set II.

The Gregg was more consistent than the Forkner group in that the Gregg Above-Average Achievers achieved higher than the Gregg Average Achievers at each speed in each set; and the Gregg Average Achievers achieved higher than the Gregg Below-Average Achievers at each speed in each set except for the following: speed of 90 in Set II and speed of 100 in Set I.
Because Set III represented the terminal level of achievement of the students at the end of one year of study of Forkner and Gregg Shorthand, the following comparison of the percentage of standard words correctly transcribed by the students in the two systems was made. Complete data for the following discussion are given in Appendix E.

Except for the Forkner Below-Average Achievers at the speed of 70, each of the Forkner grade-point average groups correctly transcribed at least 94 per cent of the standard words in each of the letters at the speeds of 50, 60, and 70. The Forkner Above-Average Achievers correctly transcribed 89 per cent of the standard words in the letter at the speed of 80 and decreased in percentage for letters at the speeds of 90 and 100. The Forkner Average Achievers correctly transcribed 82 per cent of the standard words in the letter at the speed of 80 and then decreased in percentage for letters at the speeds of 90 and 100. The Forkner Below-Average Achievers correctly transcribed 85 per cent of the standard words in the letter at the speed of 70 and decreased in percentage of standard words correctly transcribed for letters at the speeds of 80, 90, and 100.

The Gregg Below-Average Achievers correctly transcribed 86 per cent of the standard words in the letter at the speed of 50 and then decreased in percentage for
letters at the speeds of 60 and higher. Except for the Gregg Average Achievers at the speed of 70, the Gregg Above-Average Achievers correctly transcribed at least 90 per cent of the standard words in each of the letters at the speeds of 50, 60, and 70. The Gregg Above-Average Achievers correctly transcribed 69 per cent of the standard words in the letter at the speed of 80 and decreased in percentage for letters at the speeds of 90 and 100. The Gregg Average Achievers correctly transcribed 53 per cent of the standard words in the letter at the speed of 80 and then decreased in percentage for letters at the speeds of 90 and 100.
CHAPTER VI

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the study was to determine the learning difficulty of the Forkner Alphabet Shorthand system as compared with the Gregg Shorthand System, Diamond Jubilee Series, as measured by the dictation speed and standard words correctly transcribed of eleventh- and twelfth-grade high school students.

The experimental method of research was used in the study, which was conducted during the second semester of the 1965-1966 school year. Eight schools in which Forkner Shorthand was taught and ten schools in which Gregg Shorthand, Diamond Jubilee, was taught were used. A total of 536 students - 234 Forkner students and 302 Gregg students - participated. A sample of 180 students' transcripts were selected at random for statistical treatment.

Three dictation sets, each containing a letter at the speeds of 50, 60, 70, 80, 90, and 100 words a minute, were constructed from actual business letters. The taped dictation and the transcription were administered by the 18 participating teachers. The transcripts were returned to the writer for checking and analysis.

The data were processed by means of the IBM 7094 system at The Ohio State University Computer Center. The
analysis of variance with four factors was used for the statistical treatment of the data.

**Findings**

The following summary statements represent the major findings of the study based upon (1) a comparison of the achievement of students in both Forkner and Gregg shorthand on three sets of dictation material given at five-week intervals during the second semester of the 1965-1966 school year; (2) the use of the factorial analysis of variance in the statistical treatment of the data; and (3) the application of the F-test to determine whether there were significant differences in the main and interactive effects of the four independent variables (system, grade-point average, speed, and set) and the dependent variable (standard words correctly transcribed):

1. The achievement of the Forkner students was significantly higher than the achievement of the Gregg students. The F-ratio was 66.63, which was highly significant at the .05 level of confidence.

2. There were no significant differences in the interactive effects of the four factors and the achievement of the students. The following statements present more specific findings concerning the interactive effects:

   **System-speed**

   a. The Forkner group achieved higher than the Gregg group at each speed level.
b. Both the Forkner and Gregg students decreased in the number of standard words correctly transcribed after the speed of 70.

System-GPA

c. The Forkner group achieved higher than the Gregg group at each grade-point average level.

(1) The Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers.

(2) The Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers.

System-set

d. The Forkner group achieved higher than the Gregg group in each of the three sets of dictation.

(1) In Set III, the Forkner group showed a greater increase in the number of standard words correctly transcribed than the Gregg group.

System-speed-GPA

e. The Forkner group achieved higher than the Gregg group at each speed level in each grade-point average level.
(1) The Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers at each speed except for the speeds of 90 and 100.

(2) The Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers at each speed except for the speeds of 80 and 100.

System-speed-set

f. The Forkner group achieved higher than the Gregg group at each speed level in each set of dictation.

(1) Both the Forkner and Gregg groups increased in the number of standard words correctly transcribed at each speed level from Set I to Set II and from Set II to Set III except for the following: Forkner, speed of 80 from Set I to Set II and at the speed of 50 from Set II to Set III; Gregg, speed of 50 from Set II to Set III.

(2) From Set I to Set II at the speeds of 50, 60, and 70, the increase in the number of standard words correctly transcribed by the Gregg group was greater than the Forkner group.
From Set I to Set II and from Set II to Set III at the speeds of 80, 90, and 100, the increase in the number of standard words correctly transcribed by the Forkner group was greater than the Gregg group.

**System-GPA-set**

**g.** The Forkner Above-Average, Average and Below-Average Achievers achieved higher than the corresponding levels of grade-point average of the Gregg achievers.

1. In Sets I and III, the Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers.
2. In Sets II and III, the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers.

**System-GPA-speed-set**

**h.** Above-Average Achievers

1. The Forkner Above-Average Achievers achieved higher than the Gregg Above-Average Achievers at each speed level in each set except for the speed of 60 in Set II and the speed of 100 in Set I.
i. Average Achievers

(1) The Forkner Average Achievers achieved higher than the Gregg Average Achievers at all speed levels in each set of dictation.

j. Below-Average Achievers

(1) The Forkner Below-Average Achievers achieved higher than the Gregg Below-Average Achievers at all speed levels in each set except for the speed of 100 in Set I.

k. Additional Comparisons

(1) The Forkner Average Achievers achieved the same or higher than the Gregg Above-Average Achievers at each speed level in each set except for the following: speed of 80 in Set II; speed of 90 in Sets I and II; and speed of 100 in Sets I and II.

(2) The Forkner Below-Average Achievers achieved the same or higher than the Gregg Average Achievers at each speed level in each set except for the following: speed of 80 in Sets II and III; speed of 90 in Sets I and III; and speed of 100 in Set III.
(3) The Forkner Above-Average Achievers achieved higher than the Forkner Average Achievers except for the following: speed of 60 in Sets II and III; and the Forkner Average Achievers achieved higher than the Forkner Below-Average Achievers except for the following: speed of 50 in Set III and speed of 90 in Set II.

(4) The Gregg Above-Average Achievers achieved higher than the Gregg Average Achievers at each speed in each set; and the Gregg Average Achievers achieved higher than the Gregg Below-Average Achievers at each speed in each set except for the following: speed of 90 in Set II and the speed of 100 in Set I.

(5) When the mean achievement was compared with the total standard words in each letter in Set III, each of the Forkner grade-point average groups correctly transcribed at least 94 per cent of the standard words in each letter at the speeds of 50, 60, and 70. The Forkner Above-Average Achievers correctly transcribed 89 per cent of the
standard words in the letter at the speed of 80 but 89 per cent and less in the letters at the speeds of 90 and 100; Forkner Average and Below-Average Achievers transcribed 82 per cent and less at the speeds of 80 and higher.

(6) The Gregg Above-Average Achievers correctly transcribed at least 90 per cent of the standard words in the letters at the speeds of 50, 60, and 70 but 69 per cent and less in the letters at the speeds of 80 and higher; Gregg Average Achievers, at least 81 per cent in the letters at the speeds of 50, 60, and 70 but 53 per cent and less in the letters at the speeds of 80 and higher; and Gregg Below-Average Achievers, at least 72 per cent of the standard words in the letters at the speeds of 50, 60, and 70 but 40 per cent and less in the letters at the speeds of 80 and higher.
Conclusions

The following conclusions regarding the Forkner and Gregg Shorthand systems are based upon the major findings presented above.

1. The Forkner Alphabet Shorthand System is easier to learn than the Gregg Shorthand System, Diamond Jubilee. This conclusion is based upon the following data:

   In a comparison of the main effects of system and achievement, the Forkner group achieved significantly higher than the Gregg group. In the interactive effects of system-speed and achievement, system-GPA and achievement, and system-set and achievement, the Forkner group achieved higher than the Gregg group at each speed level, in each grade-point average level, and in each set of dictation.

2. The learning progress of first-year Forkner Alphabet Shorthand students is greater than the learning progress of first-year Gregg Shorthand, Diamond Jubilee, students. This conclusion is based upon the following data:

   In the interactive effects of system-set and achievement, the Forkner group achieved higher than the Gregg group in each of the three sets of dictation. In the interactive effects of system-set-speed and achievement, the Forkner group showed a greater increase than the Gregg group at the higher speeds of 80, 90, and 100 in each set.
In Set III, terminal achievement, the Gregg group showed a tapering-off tendency while the Forkner group showed a continued upward tendency in achievement.

3. The Forkner Alphabet Shorthand System is better adapted than the Gregg Shorthand System, Diamond Jubilee, to the Above-Average, Average, and Below-Average Achievers. This conclusion is based upon the following data:

In the interactive effects of system-GPA-speed and achievement, the Forkner group achieved higher than the Gregg group at each speed level in each grade-point average level. Also, the Forkner Average Achievers achieved higher than the Gregg Above-Average Achievers except for the speeds of 90 and 100; and the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers at each speed except for the speeds of 80 and 100.

4. For a one-year shorthand course, the Forkner Shorthand System is superior to the Gregg Shorthand System. This conclusion is based upon the following data:

In the interactive effects of system-speed-set and achievement, the Forkner group achieved higher than the Gregg group at each speed level in each set and also showed a greater increase in the number of standard words correctly transcribed from Set I to Set II and from Set II to Set III at the speeds of 80, 90, and 100. In the interactive effects of system-GPA and achievement, the Forkner Average Achievers achieved higher than the Gregg Above-Average
Achievers and the Forkner Below-Average Achievers achieved higher than the Gregg Average Achievers.

5. If the speed of 80 words a minute is used as the minimum speed requirement for initial employment, neither the Forkner nor the Gregg shorthand students meet the requirement for initial employment as shorthand writers after one year of study. This conclusion is based upon the following data:

After a study of the speed of dictation of business letters, Winter concluded that 79 to 80 words a minute should be the minimum speed requirement for all stenographers. At each rate 80 and higher when the percentage of standard words correctly transcribed was determined from the total standard words in each letter, the Forkner group transcribed 71 per cent or less and the Gregg group transcribed 54 per cent or less of the total standard words dictated. If only the Above-Average Achievers are considered in Set III (terminal achievement), the Forkner Above-Average Achievers correctly transcribed 89 per cent or less of the total standard words dictated at each speed 80 and higher; and the Gregg Above-Average Achievers correctly transcribed 69 per cent or less of the total standard words dictated at each speed 80 and higher. The percentage of standard words correctly transcribed by the Forkner and Gregg Average and Below-Average Achievers was less than the Forkner and Gregg Above-Average Achievers.
**Recommendations**

Based upon the findings and experience gained from this study, the following recommendations for further research are made:

1. A study should be conducted during the second year of shorthand study in the Forkner and Gregg systems to determine the achievement level of students during the second year. A study such as this would reveal the achievement levels of students in both systems of shorthand and could be compared with the levels of achievement of the students used in this study.

2. Further research should be conducted to determine the standards of dictation speed and transcription rate needed in order to be called vocationally competent. Limited research has been conducted, but determination of the specific levels of dictation speed and transcription needed for classification as vocationally competent is lacking.

3. Further research should be conducted to determine more accurately the difficulty of dictation material. The use of the standard word and the use of the frequency of words as measures of difficulty as well as any other measure of difficulty should be given further experimentation.

4. Experimental research should be conducted with other abbreviated shorthand systems to determine the achievement levels of the students in those shorthand systems.
APPENDIX A

PRELIMINARY LETTERS
I am a doctoral student at The Ohio State University, Columbus, Ohio; for my dissertation, I am doing an experimental study comparing student achievement in the Forkner Alphabet and Gregg Shorthand systems. Would you give me permission to conduct part of my research study in your school by using one of your second semester (Forkner/Gregg) shorthand classes?

A copy of my proposal, which has been approved by my doctoral committee, is enclosed. The study will not require the shorthand teacher to change the pattern of regular teaching. Also enclosed are copies of two forms which I will be using to obtain background information about the school, the teacher, and students for comparative purposes.

If you approve the use of your shorthand class for this study, will you please give the enclosed materials and this letter to the business teacher who teaches the (Forkner/Gregg) shorthand class. I would appreciate receiving the enclosed postal card from the shorthand teacher as soon as possible indicating whether or not he or she will participate. All information obtained will be kept confidential. If you do not wish to have your school participate in the study, please return the enclosed card indicating this. I shall be glad to supply your school with results of the study.

I shall look forward to hearing from your school.

Sincerely yours,

Edgar Ray Smith

Enclosures: 4
Yes, you may use the first-year shorthand class in our school for your shorthand study.

No.

Name of shorthand teacher: ________________

Number of students enrolled in first-year shorthand class: ________________.
YOUR SUPERINTENDENT HAS GIVEN ME PERMISSION TO DO PART OF MY SHORTHAND STUDY IN YOUR SCHOOL. I ASSUME THAT HE HAS DISCUSSED THE MATTER WITH YOU BEFORE GIVING PERMISSION. I AM ENCLOSING A COPY OF THE PROPOSED STUDY, WHICH HAS BEEN APPROVED BY MY DOCTORAL COMMITTEE.

THE STUDY IS CONCERNED WITH STUDENT ACHIEVEMENT IN FORKNER AND GREGG SHORTHAND DURING THE FIRST-YEAR COURSE. AS YOU WILL NOTE FROM THE OUTLINE, THERE WILL BE THREE DIFFERENT SETS OF TAPED MATERIAL DURING THE SECOND SEMESTER. THE STUDENTS WILL TRANSCRIBE THE LETTERS AND THEN YOU WILL SEND THE TRANSCRIPTS TO ME. WHEN THE STUDY IS COMPLETED, I WILL BE GLAD TO SUPPLY YOU WITH THE RESULTS.

ALSO ENCLOSED ARE TWO DIFFERENT FORMS FOR COLLECTING INFORMATION ABOUT THE SCHOOL, TEACHER, AND THE STUDENTS. WILL YOU PLEASE COMPLETE SECTIONS A AND B OF FORM I AND ITEM 8 OF FORM II. IF THERE AREN'T ENOUGH COPIES OF FORM II SO THAT EACH STUDENT CAN COMPLETE ONE, PLEASE LET ME KNOW. SINCE THE SUPERINTENDENT HAS INDICATED HIS WILLINGNESS TO PARTICIPATE IN THE STUDY, I ASSUME THAT THE STUDENTS' GRADES CAN BE OBTAINED FROM THE PERMANENT RECORDS. THE INFORMATION ON FORMS I AND II IS ESSENTIAL FOR A COMPARISON OF THE TWO SYSTEMS OF SHORTHAND.

AS SOON AS THE FORMS HAVE BEEN COMPLETED, PLEASE RETURN THEM TO ME IN THE ENCLOSED STAMPED ENVELOPE.

SINCERELY YOURS,

EDGAR RAY SMITH

ENCLOSURES: FORM I - 1 COPY; FORM II - 35 COPIES
APPENDIX B

BACKGROUND INFORMATION FORMS
SCHOOL AND TEACHER INFORMATION SHEET - FORM I

School:__________________________ Teacher:__________________________

Directions: 1. Please read each item in Sections A and B of Form I and fill in the appropriate information. All information will be kept confidential.

2. For Form II, Student Information, give each student a form and have each complete Items 1 through 7. Item 8 will have to be secured from the permanent records.

3. Mail all completed forms to Ray Smith, 605 Tuscarawas court, Columbus, Ohio 43210, in the enclosed stamped envelope.

Section A - School Information

1. High school enrollment:______________.

2. Length of each class session in minutes:______ minutes; time of day each class meets (indicate hour class begins):______a.m. or______p.m.; date second semester begins:____________; number of times per week shorthand class meets:__________.

3. Primary purpose of shorthand course (check one):
   a. personal use
   b. vocational

4. How long is the shorthand course in semesters (check one):
   1 sem.
   2 sem.

5. Is there a tape recorder available (check one):
   yes
   no

Section B - Teacher Information

1. Total number of years, excluding this year, that you have taught (Forkner/Gregg) shorthand:_____; number of years, excluding this year, that you have taught (Forkner/Gregg) shorthand:_____.
Teacher Information - Continued

2. Educational training in (Forkner/Gregg) shorthand: _______ months.

3. Did you receive your training in (Forkner/Gregg) shorthand through (check one):
   ___a. workshop
   ___b. self-study
   ___c. course instruction
   ___d. other; indicate _________________________________________

4. Degree(s) you hold, year(s), and where obtained:

   Degree | Year | Institution
   ------ | ---- | ---------------
   ______ | ____ | _______________
   ______ | ____ | _______________

5. Name of any other shorthand system you have taught. (If none, write "none.")
   _____________________________________________________________

6. Name of shorthand system you prefer to teach:____________________

   STUDENT INFORMATION SHEET - FORM II

Directions: Please supply the necessary information for Items 1 through 7. Item 8 will be completed by your teacher.

1. Name: ____________________ Last __________ First __________ Middle

2. Year in high school (check one):
   ___a. junior
   ___b. senior
   ___c. other; indicate _________________________________________

3. Age: __________

4. Sex:
   ___a. male
   ___b. female
Student Information Sheet - Continued

5. Reason for taking shorthand course:
   ___a. personal-note taking use
   ___b. vocational use on a job
   ___c. other; indicate ____________________________

6. Have you studied this system of shorthand before?
   ___a. yes
   ___b. no

7. Name of any other shorthand system you have studied:
   ______________________; (If you have, for how many
   semesters: ________ semesters)
   ...........................................

8. Grade-point average of this student for all classes
   taken in Grades 9 and 10: ____________.

   Is this average based on a four-point scale where A
   equals 4 OR is it based on a three-point scale where
   A equals 3 OR some other system?
   ___a. four-point scale used
   ___b. three-point scale used
   ___c. other; explain ________________________________.
APPENDIX C

LETTERS IN DICTATION SETS
Dear Miss Jones:

Thank you for your letter of May 10 telling us how much you enjoyed your flight with us from New York City to San Francisco. Your comments are very much appreciated.

During the past ten years, we have added many new flights to enable people to go from one part of the country to another quickly and on time. Because of our constant concern for improved service, we have made travel by jet available on most of our flights. As you may know, we have also eliminated the weight requirement for your bags and have adopted the policy of allowing two pieces of checked baggage for each passenger. In addition, a small case may be carried with you.

In the future when you have occasion to travel, we hope that you will fly with us again. Comments from our customers are always welcomed.

Sincerely yours,

*Each letter was three minutes in length.*
Gentlemen:

I would like to make a reservation at your American Hotel for Monday, Tuesday, and Wednesday, March 8, 9, and 10. I would like to have a double room for my wife and me. We shall arrive during the morning of March 8 and would appreciate it if we could check into our room when we arrive.

While we are in Dallas on this trip, my wife and I want to visit several places of interest. Could you perhaps suggest some of the more important places of interest and also some good places to eat. Since we are interested in seeing a play, we would like to receive information you may have concerning any play that may be appearing in Dallas during our stay in your city.

We shall be arriving and leaving by air. I assume that transportation will be available from the airport to your hotel. Will there be transportation from your hotel to the airport at the time we leave, or will we have to make other arrangements?

Cordially yours,
Dear Mr. Brown:

Fulton tools, as you will see from the illustrations and specifications in the enclosed catalog, are durable in construction and attractive in design. Our tools are made to give you efficient operation day after day for many years.

Our new room, which is described on pages 8 to 10 in the catalog, is a practical workshop. Each person who works for our company has to be well trained and has to be concerned constantly with quality production. Each step in the construction of each tool is carefully performed and is checked and re-checked for any deviations from the plan. By just looking at it, you can see the fine workmanship that has gone into each tool.

After each tool has been assembled and examined in the new room, one last check is made to insure that it has met our rigid specifications. Each tool is then carefully wrapped and stored in a warehouse which was especially built to house these tools.

Why not come into our store soon to examine the beautiful workmanship which has gone into our special tools. Before coming in, you will want to look through our company catalog to determine which tools you want to check.

Sincerely yours,
Dear Friend:

Because you are one of our valued customers, we want you to receive special service. Therefore, we want you to have an opportunity for a preview and first choice during our annual spring sale of furniture and home furnishings.

All you have to do is give the enclosed card with your name stamped on it to a salesman in our store during the days of Monday, Tuesday, Wednesday, or Thursday, March 8, 9, 10, or 11. The items you will see on special sale will not be offered to the public until March 12.

In this week, you may buy any item listed in the enclosed brochure. Only persons, such as you, who are our steady customers, will be able to buy these items at the listed prices.

When you see the items in our store, you will be pleased with the savings on each piece of furniture purchased and also on room furnishings. Both modern and traditional pieces are included in this sale. You will find such makers of quality furniture as Home, Moreland, and Goodman represented in this exciting sale event. As a
special charge customer, you may take advantage of these values with no down payment at the time of your purchase.

Remember, just give the enclosed card to any salesman on March 8, 9, 10, or 11 for these special savings on furniture and home furnishings.

Sincerely yours,
Dear Mr. Baker:

How would you like to be on a sunny beach in a tropical paradise? You can enjoy the comforts of such a luxury holiday at a very reasonable cost. The enclosed brochure gives a listing of our rates.

Now that the wintry storms are blowing up, a vacation in the tropical area of southern Florida would be ideal. Tampa offers you a wonderful spot for a winter vacation that you will not forget. You can board a plane in your home town and arrive in sunny Tampa within a few hours. Once you arrive, you can stay at our luxury hotel and just relax and enjoy the many activities available in the area.

You will be able to enjoy fishing, swimming, skin diving, water skiing, and golfing, among other activities; or just relax in the friendly sun. You can obtain a healthy tan while relaxing in the sun on our fine beach.

The enclosed brochure tells you what you can do and what you will be able to see while you are here. If you prefer, you may take a short cruise through the islands to the south of Florida. There are many excellent trips from
which you may choose to fit the number of days you wish to be gone. Arrangements for a cruise may be made after you have arrived.

Plan now to take a winter vacation. All you have to do is return the enclosed postage-paid envelope indicating the day of your arrival, the number of days you plan to stay, and the number of people in your group.

Very sincerely yours,
Dear Reader:

We hate to lose an old friend such as you at a time when we are sure you would enjoy the many relaxing hours of reading pleasure. Because we do not want you to miss this pleasant experience, we are willing to make you a special offer. Just punch out the circle on the enclosed certificate, and we will send you a full year of High Lights, or 52 issues, for only $5. This amount is a savings of 50 per cent from the regular annual subscription value of $10; and it is the lowest rate per copy for which anyone can buy High Lights.

As you may know, High Lights provides an unconditional money-back guarantee. If, after reading a few issues, you do not agree that High Lights is all that you expect, just write us and we will gladly see that you get a full refund on all copies not yet mailed.

In the past year, High Lights received 20 awards from many civic and educational organizations. This same story has been true throughout our many years. It is one of the most honored magazines in the field. In each issue, informative, exciting, and entertaining articles are to be
found. Each issue will give an insight into the important happenings in the world today and the people behind them. You will be able to visit many places in the world.

So take advantage of this High Lights special. When you consider that you get a subscription for one year for only $5, an unconditional guarantee, and many hours of reading enjoyment, I am sure you will agree that you won't want to miss one issue. Just mail the circle on the special certificate in the enclosed envelope.

Sincerely yours,
Dear Mr. Harper:

Your check in the amount of $9, which covers payment of your telephone account No. 7798, has been returned to us by the bank because of insufficient funds.

Since I have been unable to contact you by telephone, I want to advise you that we have recharged this amount to your account. The total amount now due on your bill is $9. May we have payment for this amount? After receiving payment, we shall send you the check for $9 which was returned to us on January 31.

We are sure that this was an oversight on your part. Your record of payment for past service has been excellent. We know that you will want to take care of this matter immediately. A stamped envelope is enclosed for your convenience in sending us your payment.

If you have any questions, telephone us.

Cordially yours,
Dear Friend:

The enclosed coupon is worth $2 to you. Just detach and mail it today. You will promptly receive a full year's trial subscription to Home.

At regular subscription rates, a year of Home is a $4 value; but your coupon will give you this half-price saving. You pay only $2; and we will bill you later after your first copy of Home arrives.

Your satisfaction is fully guaranteed. Even at this special half-price offer, if ever you are not 100 per cent delighted with Home, just ask and you will receive a full refund for all copies not yet in the mail.

You and the members of your family will look forward every other Tuesday to each issue of Home and the special treatment of entertainment, sports, foods, home living, fashions, and humor. You will also like the many informative articles concerning health and science as well as those about world and national affairs.

Mail your coupon today in the enclosed envelope. You will be glad you did.

Cordially yours,
Dear Mr. Waterman:

Because you expressed an interest in our rugs, we are offering you a free Craft Rug Kit. It is free when you order one of our regular rug kits. The complete free kit consists of a special needle which you can use when making any of our rugs, material necessary for making a 2 by 3 foot rug, a supply of quality yarn in the color of your choice, and a complete, easy-to-follow instruction booklet.

With these kits, you can make beautiful rugs which will call attention to your floor. If you have never tried this kind of handicraft before, you will be amazed how easy and enjoyable it is to make these rugs. It will be possible for you to complete a rug like an expert immediately. Your hands can work speedily and accurately while you talk with a friend, listen to the radio, or even watch television.

Order a Craft Rug today. You need only complete the enclosed order form and return it to us, with your check for $5, in the return envelope. With the regular rug kit you select, we will send you a free Craft Rug Kit. Act now while all designs are available.

Sincerely yours,
Dear Neighbor:

If you need money for any reason, you can borrow it here at low bank rates and take three years to repay. For example, $1,000 is just $34 a month. You receive the debt-cancelling life insurance protection at no additional cost.

Also, you can get almost any amount you need for reasons such as paying off emergency bills, purchasing new furniture and appliances, taking that vacation you have always wanted, or reducing your cash outlay each month by consolidating your present installment debts. Many customers cut monthly payments by half or more.

Find out how much less you will pay. Just list your present debts and the amount you have to pay each month on the back of the enclosed card. Then, check the table to see how much less you will pay with one of our loans. When you see how much less you can pay monthly, call me at my office. It will take only a few minutes to plan your loan. Borrowing from us is completely private and strictly confidential.

If you plan to buy a car, you will be interested in our automobile financing. Our plan includes low cost
bank interest, 36 months to repay, and debt-cancelling life insurance at no added cost. Just tell your dealer to charge it at our bank, or stop in tomorrow and we will help you purchase that new or used car immediately.

Sincerely,
Dear Mr. Day:

Our city levies a tax on all earned income of resident individuals, regardless of where earned, and on earned income for services performed within the city limits by all non-resident individuals. It has been established that the state college, the state house, and the state office buildings are located within the city. The rate of the tax is 1 per cent on gross earnings, and there are no deductions.

The Federal Government does not withhold this tax but furnishes the City Income Tax Division with the annual earnings of all Federal employees in the city for the past year.

The college did not withhold the income tax in 1965, and a tax return must be filed for that year. Each department of the state withheld part of the tax if it was requested by the employee. Whether any tax was withheld or not, a tax return must be filed so that your account may be closed if it has a balance. A city resident who is employed by a company located outside the city is also required to file and pay this tax.
Enclosed is an Individual Income Tax Return for the past year. Be sure that your name and address are written in the spaces provided. The return must be filed with this office and the tax must be paid on or before April 15. If you have an unpaid bill for past years, a return for each year must be filed and the tax and interest paid with the return.

For further help, see the attached booklet.

Cordially yours,
Dear Mr. Good:

As soon as some people stop tearing up their cars, we can tear up our rate increases. Last year, more than 50,000 people died on our highways and well over a million were injured. Your newspaper told about it every day and also reported the rising costs of these traffic accidents. Damage costs have gone up to the highest level ever.

Accidents do not have to happen. If each person drove with an alert attitude, thousands of lives could be saved each year on our roads. Today, you have to drive carefully for yourself and the other driver as well. Each day a record number of new cars is added to our present over-crowded streets and highways. It all adds up to a very high accident cost. The only thing that an auto insurance company can do is process and pay the claims and then present the bill to the people who drive.

At our company, every effort is made to keep insurance rates to a minimum. One way of achieving this is by insuring only careful drivers such as you. Keeping operating costs down is one other way in which we strive to reduce costs. While costs for most businesses are up all
over the country, our company has been able to cut operating expenses in the last few years.

For you, our automobile insurance means the best car insurance buy plus our famous home-town service wherever you drive. With us, you are insured with the world's largest network of full-time agents and salaried claims representatives. If your rate is up and you have any questions, please be sure to call your agent. We appreciate having you as one of our preferred customers.

Sincerely yours,
Gentlemen:

During the time I was attending the special conference of the State Council as a delegate, it was a pleasure to be a guest at your hotel from January 15 through January 19. My room number was 202.

In my hurry to catch the limousine to the airport, I left an all-weather coat hanging on a rack near the dining room in your hotel. The large-size coat was brown and had a Smith Brothers label. The zipper lining had been removed. If this coat is hanging in your office, I would appreciate very much getting it back. I shall be glad to pay the postage for sending it to me.

Your hotel is one of the best that I have seen. The private accommodations were excellent, and the meeting rooms were outstanding. Also, the service was good; and the charges were very reasonable.

Sincerely,
Dear Mr. Williamson:

We are pleased you and Mrs. Williamson can visit with us on September 20. There is never enough time for a visitor to see as much or talk to as many persons as would be desirable. However, we shall try to give you as complete a look at our community as we can during your visit here.

I have made reservations for you at the Johnson Motor Lodge, which is just off Highway 40. The Motor Lodge is located on the right side of the highway just inside the city limits. Upon your arrival, telephone me at my office. We can have dinner together and spend the remainder of the evening at my home. The next morning we can take a drive through the community; then Mary can visit with my wife while we continue our discussion at the office.

Please complete the enclosed personal data sheet, and either mail it to me or bring it with you. We shall look forward to a very pleasant visit with you and your wife.

Cordially yours,
Dear Mr. Patrick:

We have your letter dated October 26 regarding your tire problem. We can appreciate the trouble you have had because this is a tire problem rather than a defect in your automobile. The fact that you have had the problem twice within a short length of time would certainly give you reason to be disappointed with the performance of the tires.

If you were in St. Louis, we would handle the situation directly with the tire company. Because you are not, we would suggest that you write directly to the Firestone Tire and Rubber Company, Akron, Ohio, with a complaint. We have known of case where a letter of complaint has gotten action from a local Firestone representative. We would be interested to learn how the company settles the problem. If it is necessary for you to have a statement concerning the service which has been performed on the car, we will be glad to give it to you. We have complete records on the service that we have given your car during the past year.

If you are going to be in St. Louis in the near future, we would be very glad to handle the matter for you.

Cordially,
Dear Mr. Lane:

Enclosed is a chart which shows some typical city-by-city savings from our preferred-rate auto insurance program. Is your home town, or a town like it, on our chart? By looking at the chart, you will get a good idea how much money you can save each year by buying auto insurance through our plan. For an even better idea of the savings, send in the rate quotation card. There is no obligation, and no salesman will call on you.

This plan is offered by Executive Insurance Company, a company that specializes in insuring professional persons such as you. The typical executive can expect to save $10 to $30 a year by insuring his car with us, which is enough in most cases to pay for state and local professional dues.

The money that you save depends, of course, on where in the state you live and how your car is used. That is why we think it would pay you to take five minutes to fill in the card and see just how much the savings would be.

As one of our policyholders, you can expect prompt and efficient service because you will be dealing directly
with the company. Routine information is exchanged by mail; but when an immediate answer or fast action is desired, simply pick up the phone and call the home office collect.

Cordially,
Dear Reader:

Because we have good reason to believe that you belong among its many readers, we would like to send you the next 20 issues of Town for one-half the regular price. Just return the enclosed card, and you will receive Town at the special rate of 20 weeks for only $2. What is more, you need send no money now. For your convenience, we will bill you later after your issues start to come. You will not want to miss one issue.

We know that as a person with above-average background and interests, you will really like the variety of reading pleasure that Town brings you each week. Therefore, we are inviting you to try it at some expense to us in the belief that after you have discovered for yourself how much stimulation and entertainment it offers, you will want the magazine to enrich your leisure hours each week.

Unlike news publications, Town is concerned with style as well as content. It carries a special section in full color in every issue covering many areas of interest. Town spares no expense to insure quality in everything from the finest editorial staff to the fastest printing and distribution. The result is a unique magazine.
Let Town show you how much more easily you can keep up with every facet of the news and how rewarding it can be to do so. The savings at the special 20 weeks for $2 rate are considerable. I hope that you will sign the card and mail it right back to me.

Sincerely,
Dear Senior:

Graduation will be one of the high points of your life. It is a gateway to a new way of living, and it signifies a recognition for your long and hard work. You may be very proud of your achievements. On behalf of the 23,000 Phillips dealers, I would like to extend best wishes to you on your forthcoming graduation from college.

As you enter into your new work, we want to be counted among your early business friends. We would like to serve you in a first-class manner as I know you will want to serve your associates. Friendly and efficient service is our goal, and we are glad that our quality products are known as being among the best available in any part of the world.

We invite you to join the more than two million motorists now adding to their days of driving pleasure through the convenience of a Phillips credit card. The diploma you will soon receive can be your credit reference. As soon as the enclosed card is received, your credit card will be on its way to you.

Your Phillips credit card offers you many advantages. Throughout the United States and Canada, it will provide...
for all your motoring needs without the bother of carrying cash. Tire and battery buying can be handled on no-interest budget terms. Also, the statement each month is a valuable tax record; and you may further establish your credit rating simply by using us as a credit reference. You will be glad to have the card.

May we count you among our many friends and customers? We shall look forward to the opportunity of serving you in the near future. Just return the enclosed card.

Very truly yours,
APPENDIX D

MATERIALS FOR EACH SET OF DICTATION
Thank you for returning the materials so promptly. Enclosed with this letter are the following materials:

one tape
one copy of Instructions (Sheet 1-A)
one copy of the Transcript of the Tape (Sheet 2-A)
one time card.

In addition, I am enclosing the amount you spent for postage for returning the materials of the last set. If the amount is incorrect, or if you have had additional postage because of insufficient postage on the materials I have sent to you, please let me know.

Please read the Instructions given on Sheet 1-A before playing the tape. All instructions are given on the tape for the students. It is important that the procedures in the Instructions be followed carefully.

Please give the taped dictation in three parts - the first part on Wednesday, April 6; the second part on Thursday, April 7; and the third part on Friday, April 8. If your class does not meet these three days, give the dictation on the last three days of the week of April 4-8.

Again, check each letter for time. As soon as you have completed the last day's materials, return the materials to me by first-class mail in the enclosed envelopes. Please pay the postage; I will send the amount to you with the next set of materials.

Sincerely,

Edgar Ray Smith

Enclosures: 5
SAMPLE OF INSTRUCTIONS FOR THE TEACHER

Sheet 1-A

General Instructions

1. The tape is recorded at 3 3/4 speed.

2. All of the instructions of procedure and the dictation have been placed on the tape. (A transcript of the instructions given on the tape for the students is enclosed so that you may follow the procedure - Sheet 2-A.)

3. Directions for transcribing are enclosed for you to read to the students as soon as the dictation for each day has been completed. (Sheet 1-A, p. 2)

4. There are three parts to the tape. Give the first part of the dictation on Wednesday, April 6, the second part on Thursday, April 7, and the third part on Friday, April 8. Small pieces of paper indicate the beginning of the dictation for the second and third days on the tape.

5. Each day's dictation consists of a short, warm-up letter and two, three-minute dictations at the following speeds:

   first part - 50 and 100 words a minute;
   second part - 60 and 90 words a minute;
   third part - 70 and 80 words a minute.

   There is a one-minute pause after each letter so that the students may look over their notes. Students are not to transcribe during the one-minute pause.

6. All students are to take as much of the dictation as they can and transcribe as much as they can.

7. Students are to transcribe in longhand.

8. Once the tape has been started for the day's dictation, do not stop the tape until you hear the words "Turn off the machine," which occurs at the end of the 100 word-a-minute dictation on the first day, at the end of the 90 word-a-minute dictation on the second day, and at the end of the 80 word-a-minute dictation on the third day.
General Instructions - Continued

9. Since a variety of tape recorders will be used, it is necessary to check to make sure that the speed of the tape is correct. Please use your stop watch and begin timing each letter with the salutation and stop timing with the complimentary close. Please record the time for each letter in the spaces provided on the TIME CARD. (The transcript of the tape may be used during the dictation.)

10. Allow 11 minutes for the playing of the tape and 30 minutes for the transcription of the two letters each day.

Return of Materials

11. As soon as the letters have been transcribed for all three days, send me the transcripts, tape, and Time Card in the enclosed envelopes by first-class mail. Will you please pay for the postage and I will send you the amount with the next set of materials. (You may destroy the instructions.) (Use the large envelope for the tape and time card and the small envelopes for the transcripts.)

Sheet 1-A
Page 2

Directions - Dictation/Transcription Days

1. Start the tape.

2. Using your stop watch, begin timing each letter with the salutation and stop timing with the complimentary close. Indicate the time for each letter on the Time Card.

3. On each day turn off the tape recorder as soon as you hear the words "Turn off the machine."

4. Indicate the number of minutes and seconds for each letter on the Time Card if you have not done so.

5. Read the following Directions for Transcription to the students after the completion of the 100 word-a-minute dictation on the first day, the 90 word-a-minute dictation on the second day, and the 80 word-a-minute dictation on the third day:

"Use your regular shorthand paper for the transcripts. Transcribe in longhand. Place each letter on a separate
Directions for Dictation/Transcription - Continued

sheet. Write on one side of the paper only. It
doesn't matter if there is some other shorthand
on the back. Place your name on the upper right-
hand corner for each letter and the speed of the
letter like this (PLACE ON THE BOARD): Ray Smith - 50 warn

First Day: "Begin by transcribing the 50 word-a-
minute dictation; then the 100 word-a-
minute dictation. You are to transcribe
as rapidly as you can write legibly. You
will be given sufficient time to transcribe
all of the dictation for which you have
adequate notes."

(Second and third day's directions similar except for
change in the speeds for each day.)

"Ready? Begin to transcribe."

6. Allow 30 minutes for transcription. Then say: "Stop!
Arrange your transcripts so that the slowest speed is
on top. Be sure that your name and speed are on each
sheet. Do not include your shorthand notes."

7. Staple the two letters together each day.

8. Collect the transcripts for the day.

9. You are not to mark the transcripts. Return them to me
for checking. Instructions for returning the materials
are given on Sheet 1-A, p. 1.
"Today you will be given a series of two letters dictated at speeds of 50 and 100 words a minute. Tomorrow you will be given two more letters which will be dictated at 60 and 90 words a minute; and on the following day, you will be given two more letters which will be dictated at 70 and 80 words a minute. The slowest speed will be given first each day and each letter will be three minutes in length. Please record the dictation in shorthand. Take as much of the dictation at the various levels as you can. You will have one minute after each letter to look over your notes. Please do not write out any words in your notes. Above your notes for each letter, place the speed indicated. The signal for the dictation to begin will be the word ready."

"The first letter is a short, warm-up letter and is not to be transcribed. After the warm-up letter, there will be a one-half minute pause."

"This is the Warm-up letter." "Ready?"

"Dear Mr. Jones: . . . Yours very truly,"

"Now place a line through the warm-up letter; it is not to be transcribed. The following letters will be transcribed."

"The following letter will be dictated at 50 words a minute. Indicate 50 words a minute in your notebook." (Pause for 10 sec.) "Ready?"

"Dear Mr. Harper: . . . Cordially yours,"

(One-minute pause)

"Stop reading."

"The following letter will be dictated at 100 words a minute. Indicate 100 words a minute in your notebook." (Pause for 10 sec.) "Ready?"

"Dear Mr. Good: . . . Sincerely yours,"

(One-minute pause)
First Day's Material - Continued

"Stop reading."

"This ends the dictation for today. Beginning with the lowest speed, you will transcribe as much of the dictation as you can from your notes. Your teacher will give you instructions for transcribing."

"Turn off the machine."

Sheet 2-A
Page 2

Second Day's Material (Beginning at the first paper marker.)

"Today you will be given two more letters dictated at speeds of 60 and 90 words a minute. The slowest speed will be given first and each letter will be three minutes in length. Please record the dictation in shorthand. Take as much of the dictation at the various levels as you can. You will have one minute after each letter to look over your notes. Please do not write out any words in your notes. Above your notes for each letter, place the speed indicated. The signal for the dictation to begin will be the word ready."

"The following letter is a short, warm-up letter and is not to be transcribed. After the warm-up letter, there will be a one-half minute pause."

"This is the warm-up letter." "Ready?"

"Dear Mr. Brown: . . . Sincerely yours,"

"Now place a line through the warm-up letter; it is not to be transcribed. The following letters will be transcribed."

"The following letter will be dictated at 60 words a minute. Indicate 60 words a minute in your notebook." (Pause for 10 sec.) "Ready?"

"Dear Friend: . . . Cordially yours,"

(One-minute pause)

"Stop reading."
Second Day's Material - Continued

"The following letter will be dictated at 90 words a minute. Indicate 90 words a minute in your notebook." (Pause for 10 sec.) "Ready?"

"Dear Mr. Day: . . . Cordially yours,"

(One-minute pause)

"Stop reading."

"This ends the dictation for today. Beginning with the lowest speed, you will transcribe as much of the dictation as you can from your notes. Your teacher will give you instructions for transcribing."

"Turn off the machine."

Sheet 2-A
Page 3

Third Day's Material (Beginning at the second paper marker.)

"The two letters today will be dictated at 70 and 80 words a minute. The slowest speed will be given first and each letter will be three minutes in length. Please record the dictation in shorthand. Take as much of the dictation at the various levels as you can. You will have one minute after each letter to look over your notes. Please do not write out any words in your notes. Above your notes for each letter, place the speed indicated. The signal for the dictation to begin will be the word ready."

"The following letter is a short, warm-up letter and is not to be transcribed. After the warm-up letter, there will be a one-half minute pause."

"This is the warm-up letter." "Ready?"

"Dear Mr. Davis: . . . Sincerely yours,"

"Now place a line through the warm-up letter; it is not to be transcribed. The following letters will be transcribed."

"The following letter will be dictated at 70 words a minute. Indicate 70 words a minute in your notebook." (Pause for 10 sec.) "Ready?"
Third Day's Material - Continued

"Dear Mr. Waterman: . . . Sincerely yours,"

(One-minute pause)

"Stop reading."

"The following letter will be dictated at 80 words a minute. Indicate 80 words a minute in your notebook."

(Pause for 10 sec.) "Ready?"

"Dear Neighbor: . . . Sincerely,"

(One-minute pause)

"Stop reading."

"This ends the dictation for this set of materials. Beginning with the lowest speed, you will transcribe as much of the dictation as you can from your notes. Your teacher will give you instructions for transcribing."

"Turn off the machine."
SAMPLE OF TIME CARD

TIME CARD

Indicate length of time for each letter

First Day:  50 wam - ___ min. ___ sec.
            100 wam - ___ min. ___ sec.

Second Day: 60 wam - ___ min. ___ sec.
             90 wam - ___ min. ___ sec.

Third Day:  70 wam - ___ min. ___ sec.
             80 wam - ___ min. ___ sec.
APPENDIX E

MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS
The figures given in the following tables represent the means of standard words correctly transcribed.

**TABLE 9**

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS**

<table>
<thead>
<tr>
<th>System</th>
<th>Achievement</th>
</tr>
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<tbody>
<tr>
<td>Forkner</td>
<td>145</td>
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<tr>
<td>Gregg</td>
<td>122</td>
</tr>
</tbody>
</table>

**TABLE 10**

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS AT EACH SPEED LEVEL**

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<th>System</th>
<th>50</th>
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<th>100</th>
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</thead>
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<tr>
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<td>166</td>
<td>157</td>
<td>153</td>
<td>139</td>
<td>109</td>
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<td>134</td>
<td>149</td>
<td>126</td>
<td>126</td>
<td>107</td>
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**TABLE 11**

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS BY GRADE-POINT AVERAGE**

<table>
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<tr>
<th>System</th>
<th>Achievers</th>
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<td>147</td>
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### TABLE 12

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS BY SETS OF DICTATION**

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### TABLE 13

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS BY GRADE-POINT AVERAGE AND SPEED**

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<td>162</td>
<td>163</td>
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<td>120</td>
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<td>Below</td>
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<td>158</td>
<td>132</td>
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<tr>
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<td>149</td>
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### TABLE 14

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS**

**BY SPEED AND SET**

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### TABLE 15

**MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS**

**BY GRADE-POINT AVERAGE AND SET**

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TABLE 16
MEAN ACHIEVEMENT OF FORKNER AND GREGG GROUPS
BY SYSTEM, GRADE-POINT AVERAGE, SPEED, SET

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<th>Speed</th>
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TABLE 17
PER CENT OF STANDARD WORDS CORRECTLY TRANSCRIBED IN
SET III BY FORKNER AND GREGG ABOVE-AVERAGE, AVERAGE, AND BELOW-AVERAGE ACHIEVERS

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<thead>
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BIBLIOGRAPHY

Books


Periodicals


Pamphlets


Research Studies


