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A study to analyze the frequency of use of Gregg shorthand symbols in business communications

Robert J. Hardig
Southern Illinois University Edwardsville

A STUDY TO ANALYZE THE FREQUENCY OF USE OF GREGG SHORTHAND SYMBOLS IN BUSINESS COMMUNICATIONS .

by

Robert J. Hardig

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I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION

BY Robert Joel Hardig

ENTITLED A STUDY TO ANALYZE THE FREQUENCY OF USE OF GREGG SHORTHAND SYMBOLS IN BUSINESS COMMUNICATIONS

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Wilmer O. Maedke
Thesis Director

Wilmer O. Maedke
Faculty Chairman

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

The purpose of this study is to provide a basis for the logical development of a method of presenting the theory of the Gregg Shorthand system, the Diamond Jubilee Series, that will have repetition and reinforcement of the shorthand symbols and words that are the most frequently used in general business communications.

Need for the Study

In business education, as in any other area of education, there is a never ending movement to improve the current system of education. Underlying these trends is a foundation of principles. These principles are constantly being revised, but they are seldom altered drastically. One such principle is in regard to the psychology of skills--the teacher should determine a useful way to get the learner to make responses that will achieve the goal.[1] The educator must keep this in mind when considering changes in the current system of education.

Alice L. Holst has the following to say about the principles of skill building:

1. The type of the learning exercise should be typical of the type that the expert will finally use.

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[1]Lawerence M. Stolurow, "The Psychology of Skills," Delta Pi Epsilon Journal, April, 1959, p. 29.

2. The way in which the skill is practiced in the learning stages should be the same as the way in which the expert will perform the skill.

3. Only the things useful in the skill at the expert level should be included in the learning stages.

4. All new factors in the skill should be introduced one at a time and only as needed.[2]

The learner and these principles of skill building are, therefore, the primary reasons for this study being made. The need for this study is to provide the learner with a logically and realistically developed method of presenting the Gregg Shorthand System that will be typical of the expert's actual use of the skill.

Statement of the Problem

The problem of this study is to analyze the frequency of usage of the Gregg Shorthand symbols in the most frequently used words in general business communications.

Specific questions to be answered are as follows:

1. What will be the order of the symbols when listed in the order of frequency of usage--starting with the most frequently used symbols and ending with the least frequently used symbols?

2. Are all the shorthand symbols used at least one time in writing the "most frequently used words in general business communications?"

3. Do "alphabetic symbols" occur more frequently than do the "principle symbols?"

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[2]Alice L. Holst, A Self-Teaching Manual on College Note Taking With the Aid of Shorthand (New York: Columbia University, 1956), 190 pp.

Delimitations

1. The 4,949 most frequently used words in general business communications that are used in this study were selected from The Basic Vocabulary of Written Business Communications, by James E. Silverthorn in 1955.

2. The Diamond Jubilee Series of the Gregg Shorthand System is used in this study.

3. The symbols used in shorthand are numbered for this study by grouping the sounds that are written with the same symbol, with the exception of the word beginnings and word endings which are numbered separately. (See Appendix II)

Limitations

1. This study is limited by the researcher's ability to analyze the data.

2. The accuracy of the Silverthorn study is another limitation.

3. Another limitation of this study is the accuracy of the program prepared to process the data.

Definition of Terms

1. The 4,949 Most Frequently Used Words: The 4,949 most frequently used words are the most used words, with their frequency of usage, in general business communications as the findings revealed in James E. Silverthorn's study, The Basic Vocabulary of Written Business Communications.

2. Shorthand Symbols: The shorthand symbols are the outlines used to represent the various alphabetic and phonetic sounds, word beginnings, and word endings in the Gregg Shorthand System.

3. The Diamond Jubilee Series: The Diamond Jubilee Series is the edition of the Gregg Shorthand System which was published in 1963.

4. Weighted Frequency Count of Symbols: The weighted frequency count of symbols is the number of occurrences of each shorthand symbol in each of the 4,949 words times the frequency of usage of each of the words in which it is used.

5. Total Weighted Frequency Count of Symbols: The total weighted frequency count of symbols is the sum of the weighted frequency count of all 137 symbols in Gregg Shorthand.

6. General Business Communications: Correspondence containing words that might be used in any type of business describes general business communications.

7. Alphabetic Symbols: The alphabetic symbols are the symbols that are neither word beginnings, word endings, sounds represented by more than one symbol (oi), nor blends with the exception of the th blend which is alphabetic.

8. Principle Symbols: The principle symbols are all the symbols that are word beginnings, word endings, sounds represented by more than one symbol (oi), or blends except the th blend.

Summary

This study is designed to determine the order of the Gregg Shorthand symbols when ranked in the order of frequency of usage in

the most frequently used words in business communications. This is based on the word list compiled by James E. Silverthorn in his study--The Basic Vocabulary of Written Business Communications.

It is hoped that as a result of this study there will be a basis for a better method of presenting the shorthand symbols. That is, the symbols could be presented to the beginning shorthand student in order by beginning with the most frequently used symbols and by presenting the least frequently used symbols last. This would allow the student to work with and develop skill on the symbols according to the number of times they will be writing the symbols on the job.

CHAPTER II

RELATED LITERATURE

The related literature reviewed for this study included the history of shorthand in the English language, the history of Gregg Shorthand, studies of difficulties in the teaching and learning of Gregg Shorthand, and the psychology of skills as related to shorthand.

History of Shorthand

The history of shorthand goes back many years. The first system of significance to be used in the English language was developed by Timothe Bright which was issued in 1588. His system used straight lines, circles, and half circles. Although the system was very exact and easy to use, it was not practical when using anything but a very limited vocabulary.

John Willis, a London clergyman, who is called by some "the father of modern shorthand" developed a complete shorthand alphabet. He published his book Art of Stenography in the early 1600's.

A man greatly influenced by Willis was Thomas Shelton. Shelton's system, "short writing," used a number of signs expressing a combination of two or more consonants that occur together frequently, such as the ng, sh, and th. This was introduced by Shelton in 1641.[1]

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[1]H. Glatte, Shorthand Systems of the World (New York: Philosophical Library, 1959), pp. 16-21.

The oldest system of shorthand which is still in use today was developed by William Mason in 1682. It is still being used in reporting British Parliament debates.[2]

Samuel Taylor developed a system called the "Universal System of Stenography or Short Hand Writing." It is the backbone of many of the methods of shorthand which followed its introduction in 1786.

The shorthand system developed by Franz Gabelsberger, called by some the greatest inventor of a shorthand system, was very popular during his lifetime. The system developed in 1834 showed a neatness and beauty of outline which has been unsurpassed.

Isaac Pitman developed his method and introduced it in 1837. It is based on the circle, the individual signs being parts of the circle (radius, etc.). His system is designed in such a manner as to allow the symbols to be written upright and certain strokes are thickened to distinguish heavy sounding consonants from the lighter sounding consonants. For example, his b is like his p but is thickened.

The development of the "Light-Line Phonography" by John R. Gregg in 1888 was the beginning of a system that would later become "the shorthand system" in the United States and would also be adapted by many other languages. The major reason for its wide acceptance in the United States seemed to be the ability of people to achieve high speeds of taking dictation when using this system.[3]

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[2]Louis A. Leslie, The Story of Gregg Shorthand (New York: McGraw-Hill Book Company, 1964), p. 5.

[3]Glatte, op. cit., p. 36.

As a result of the endeavors of these and many other men who devoted their lives to the improvement of shorthand, it is evident that no one system is the "perfect system." All shorthand systems can and should be improved.

History of Gregg Shorthand

John R. Gregg published his first edition of Gregg Shorthand in 1888 in Liverpool, England. His first publication was "some fifty years ahead of its time in methods."[4] The second edition of Gregg Shorthand was published in Boston in 1893. The shorthand outlines were written larger and more smoothly than were the outlines in the first edition. The third edition of Gregg Shorthand was a further improvement in the writing style and was published in 1898. The fourth edition of Gregg Shorthand published in Chicago in 1902 was the last time the shorthand outlines were written by John R. Gregg.

The fifth edition of Gregg Shorthand was published in 1916. The shorthand was written by Mrs. Hubert A. Hagar. In this edition many brief forms and abbreviating devices were introduced. The Anniversary Edition, published in 1929, was named in honor of the fortieth anniversary of the first publication of the Gregg Shorthand System.[5]

The Gregg Shorthand Simplified System was published in 1949 and introduced the first major simplification of the system.

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[4]Louis A. Leslie, Methods of Teaching Gregg Shorthand (New York: McGraw-Hill Publishing Company, 1953), p. 14.

[5]Leslie, op. cit., 206 pp.

Frances Chapman noted the following in the comparison of the memory load of the Anniversary and Simplified Editions of Gregg Shorthand:

1. One change made in the Simplified Edition was that 2,511 Anniversary Shorthand forms (36 per cent) were revised.

2. The number of strokes needed to write the words in Simplified Shorthand was an increase of slightly more than 12 per cent as compared with the number of strokes needed to write the words in the Anniversary Edition of Gregg Shorthand.

3. The number of brief forms used in the Simplified Edition was forty-seven per cent less than those used in the Anniversary Edition. A total of 415 brief forms in the Anniversary Edition occurred in the first 7,033 words of the Horn and Peterson list and a total of 222 in the Simplified.

4. The total number of brief forms and derivatives given in the Anniversary Edition was 959; in the Simplified, 486, a decrease of 49 per cent.

5. The Anniversary Edition had 895 abbreviated forms and derivatives while the Simplified Edition had 161--a reduction of 82 per cent.

6. In the Anniversary Edition, a total of 175 deviations from the basic principles of writing occurred in the 7,033 most commonly used words; in the Simplified, 5, a reduction of 97 per cent.

7. The Anniversary Edition used 26 rules of writing which were not used in the Simplified Edition.

8. The Anniversary Edition used 24 prefixes and 40 suffixes which were not used in the Simplified Edition. The number of prefix forms used in the Anniversary Edition was 59; the Simplified, 35.

The number of suffixes used in the Anniversary Edition was 83; the Simplified, 43. As a result of these findings it was concluded that the Simplified Edition resulted in a reduction of the memory load required to write the first 7,033 words of the Horn and Peterson list. The decrease in memory load did result in an increase in the average number of strokes required to write the words in full.[6]

The Diamond Jubilee Series of Gregg Shorthand was introduced in 1963. The following changes were made in the Diamond Jubilee Series:

1. Many of the exceptions of various theory rules were eliminated.
2. Several of the abbreviations of words were omitted.
3. The memory load was reduced in the learning of brief forms.
4. Many of the word beginnings and word endings were omitted or modified.
5. The phrasing principles were either omitted or modified.
6. An attempt was made to improve the correlation of shorthand learning with essential transcription skills which is the desired end result of any shorthand system.[7]

Research Concerning Difficulties in Teaching and Learning Shorthand and Transcription

In addition to changes in the presentation of theory in the various editions of Gregg Shorthand, there have been many studies made in regard

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[6]Frances Carnahan Chapman, "A Comparison of the Memory Load of the Anniversary and Simplified Editions of Gregg Shorthand" (Doctor's thesis, University of Pittsburgh, 1951), 63 pp.

[7]John R. Gregg, Louis A. Leslie, and Charles E. Zoubek, Gregg Shorthand Diamond Jubilee Series, A Presentation of System Changes (New York: McGraw-Hill Book Company, Inc., 1963), 29 pp.

to factors contributing to the difficulty in reading, dictation, and transcription of shorthand. There have also been several studies in the area of the problems of the teaching, learning, and testing of shorthand.

The Jean Crowley Study

Jean Crowley made a study of the problems in teaching shorthand-transcription (Simplified Edition) in Massachusetts. She sent a questionnaire to teachers of shorthand and transcription. Some of the most frequent problems listed were:

1. The low ability of students enrolled in shorthand.
2. The limited vocabulary of pupils which included spelling, grammar, and phonetics.
3. The large number of prefixes and suffixes in the Simplified Edition of the Gregg Shorthand System for the students to memorize.
4. The shorthand material was not as good as it should be.
5. The lack of adequate time for transcription practice.[8]

The Beatrice Ferris Study

Beatrice Ferris completed a study to determine the learning difficulties of high school shorthand students using the Anniversary Edition of Gregg Shorthand. Some of the findings in this study were as follows:

1. Learning prefixes and suffixes, reading from shorthand notes, punctuation, and paragraphing became increasingly difficult during the four semesters of shorthand.

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[8]Jean F. Crowley, "A Study of the Problems and Their Solution in Teaching Shorthand Transcription in Massachusetts" (Master's thesis, Boston University, 1949), 43 pp.

2. Learning reversed letters, brief forms in context and in word lists, and copying from shorthand plate material became less difficult throughout the two years of shorthand.

3. Learning rules, sounding unfamiliar outlines, and learning disjoined prefixes and suffixes was difficult throughout the four semesters of shorthand in high school.[9]

The Hazel Flood Study

Hazel Flood made an analysis of the learning load of Gregg Simplified and the Thomas Natural Shorthand Systems. The findings included:

1. The reading ease of both systems ranged from very easy to standard with the exception of the last section of each text.

2. The running words and percentage of new words in the various sections of the two texts varied considerably--no pattern was followed.

3. The repetition of words in the Gregg text provided for the automatization (based on 10 repetitions per word) of 375 words of which three hundred ten fell in the first thousand words of the Horn and Peterson list. The Thomas System had less repetition of words than did Gregg.[10]

The Mildred Hillestad Study

Mildred Hillestad's study was concerned with the factors contributing to the difficulty of shorthand dictation in the Simplified Edition

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[9]Beatrice M. Ferris, "A Study of the Learning Difficulties of High School Shorthand Students" (Doctor's dissertation, University of Southern California, 1947), 81 pp.

[10]Hazel A. Flood, "Some Factors Involved in Learning Shorthand--Analysis of the Learning Load of Two Systems of Shorthand" (Doctor's dissertation, University of Minnesota, 1953), 310 pp.

of Gregg Shorthand. She gathered the following two types of data on the especially prepared dictation material:

1. Those characteristics in the words themselves--length of the words, measured in syllables and vocabulary level of the words, based on the frequency of use.

2. Those characteristics of the shorthand symbols for the expression of brief forms and their derivatives, blended sounds, vowel sounds, terminal t's following k or s, plurals and past tense, suffixes, and prefixes.

Hillestad found that:

1. Errors occurred less frequently on brief forms than on any other type of shorthand outline.

2. The rate of error tended to increase as the words became larger.

3. The percentage of error was more directly related to vocabulary level than it was to the number of syllables in the words.

4. Points of shorthand theory which are not consistently applied account for more errors in shorthand notes than do those principles of shorthand which are consistently applied.

5. Endings of words, other than past tense, seemed also to present some problems.[11]

The Harriet Ann Danielson Study

Harriet Ann Danielson made a study in 1959 to determine the relationship between competency in shorthand vocabulary and achievement

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[11]Mildred C. Hillestad, "Factors Which Contribute to the Difficulty of Shorthand Dictation Materials" (Doctor's dissertation, University of Minnesota, 1960), 280 pp.

in shorthand dictation. She found that shorthand vocabulary competency is significantly related to shorthand dictation achievement--as a student's shorthand vocabulary index increases, his rate of taking shorthand dictation increases.[12]

The Donald Jester Study

Donald Jester completed a study in 1959 which was concerned with the shorthand transcription process. He was interested in determining what activities make up the total time spent in the transcription process. He found that only 38.1 per cent of the overall time of transcription was devoted to the typing activity; whereas, 61.9 per cent of the time was devoted to numerous non-typing activities.[13]

Summary

There have been many studies completed on the teaching and learning of the shorthand and transcription process. This learning process should be related, as much as possible, to the actual use of the skill by the expert on the job.

Psychology of Skill as Applied to Shorthand

In developing a method of presenting shorthand to the learner, the application of the psychology of skill is very important.

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[12]Harriet A. Danielson, "The Relationship Between Competency in Shorthand Vocabulary and Achievement in Shorthand Dictation" (Doctor's dissertation, Indiana University, 1959), 142 pp.

[13]Donald D. Jester, "A Time Study of the Shorthand Transcription Process" (Doctor's dissertation, Northwestern University, 1959), 133 pp.

As Gates says in regard to the teaching of the elementary reading skill--"Do not, if you can avoid it, separate a skill from the normal function it is intended to serve."[14] He goes on to say that it is equally important that the practice matter be easy material:

> Recent studies have shown the great importance of providing pupils during the first two years with an abundance of easy reading material in paragraph organization. Various skills involved in reading continuous material such as habits of making regular progressive eye-movements, maintaining correct orientation, establishing useful rhythms, looking ahead of what is being comprehended, tying up the preceding thought with the present and oncoming, etc., cannot be exercised when the pupil is constantly engaged in struggles with unfamiliar words.[15]

These things he has to say about reading are obviously important when applied to shorthand.

Burton's comment on testing in spelling can also be applied to the use of word-list tests in shorthand. "Skills learned in isolation do not always function in real situations."[16] Burton also summarizes the skill learning process as follows:

> The integrative phase of skill learning in which meaning is developed demands varied practice which means many functional contacts and exploratory activities. The refining phase in which precision is developed demands repetitive practice. Varied practice by itself yields meaning but not efficiency; repetitive practice by itself yields efficiency but not meaning. Competent varied practice in early stages will reduce greatly the amount of repetitive practice needed later.[17]

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[14]Arthur I. Gates, The Improvement of Reading (New York: The Macmillan Company, 1936), p. 269.

[15]Ibid., p. 177.

[16]William H. Burton, The Guidance of Learning Activities (New York: D. Appleton-Century Company, 1944), p. 45.

[17]Ibid., p. 397.

Shaffer gives a good explanation of the ideal end result of teaching the shorthand skill.

> The purpose of shorthand is to produce an accurate written transcription of spoken language. The ultimate test of skill in shorthand is therefore to transcribe dictation, and the measure of achievement is the transcription, not the shorthand.
>
> Teachers who love shorthand for its own sake are easily misled in this matter. Teachers earn their living by shorthand, but their students earn their living by transcriptions.[18]

With a word list containing the most frequently used words in general business communications ranked in the order of their frequency of use it seems logical that a better method of presenting the Gregg Shorthand System could be developed. That is, a method of presentation that would better meet the needs of the student. James E. Silverthorn has developed such a word list in The Basic Vocabulary of Written Business Communications.[19]

Ralph J. Richards noted in his study:

1. From 33.2 per cent to 44.9 per cent of the first 1,000 words of the thirteen systems are common to the first 1,000 words of the Silverthorn word list.

2. A comparison of the same words with the first 4,949 of the Silverthorn list (accounting for about 95 per cent of running words in business communications) showed that from 62.8 per cent to 85.6 per cent are common to both lists.

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[18]Laurance F. Shaffer, "The Functions of Measurement," Business Education World, March, 1938, pp. 544-546.

[19]James E. Silverthorn, "The Basic Vocabulary of Written Business Communications" (Doctor's dissertation, Indiana University, 1955), p. 531.

3. In the highest ranking system, therefore, in order to learn the first 1,000 words of highest frequency, a student must learn far more than 5,000 words.

4. Basic courses of shorthand systems are unnecessarily encumbered with words which are rarely used in business communications.[20]

It would appear that as a result of these findings the current shorthand systems leave a little to be desired in fulfilling one of the goals of teaching a skill--the degree of similarity between the two activities (the learning experience and the actual use) will affect the degree of transfer.[21]

Summary

In this study there will be no attempt to improve the basic theory of the Gregg Shorthand System. However, this study will be concerned with presenting data that will, hopefully, lead to a more logical method of presenting the theory of the Gregg Shorthand System that will fulfill the needs of the learner.

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[20]Ralph J. Richards, "A Comparison of Current Shorthand Systems, Using Silverthorn's High-Frequency Word List," National Business Education World, October, 1967, p. 62.

[21]Allien R. Russon and S. J. Wanous, Philosophy and Psychology of Teaching Typewriting (Cincinnati: Southwestern Publishing Company, 1960), p. 138.

CHAPTER III

DESIGN OF THE STUDY

The first step necessary to determine the symbols most used in general business communications was to find and use a word list of the most commonly used words in any type of business which a stenographer might work. Silverthorn has developed such a word list.

The James E. Silverthorn Study

James E. Silverthorn used as a source for his word count a total of 2,039 written business communications, 1,012 different writers, and fifteen different categories of businesses in forty-one states. A total of approximately 300,000 running words was encountered in this word count. The total number of words used more than one time was 11,564.

Other important facts include the following:

1. The first 50 words comprised about 45 per cent of the 300,000 words. ("the" comprised about 5 per cent of the 300,000 words)
2. The first 100 words comprised about 50 per cent of the words.
3. The first 1,000 words comprised approximately 80 per cent of the words.
4. The first 5,000 words comprised approximately 95 per cent of the words.[1]

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[1]Silverthorn, op. cit., 531 pp.

These results indicate that the Silverthorn word list does truly represent the words most commonly used in general business communications.

After the word list was chosen, these 4,949 most frequently used words were typed and the shorthand outlines were written according to the theory of the Diamond Jubilee Series of the Gregg Shorthand System.

Coding Procedures

Upon the completion of this process, coding sheets were obtained from the Data Processing Department at Southern Illinois University at Edwardsville and the coding design was laid out. The first four columns were used for the consecutive numbering of the 4,949 words.

Column five was used to indicate the number of letters in the word to be coded. Rather than indicating the actual number of letters in the word, the coding procedure was to count one for every four letters in the word. For example, the word "must" would be coded as one because it only has one group of four letters. A word containing three letters such as "how" would be coded as zero because it does not have four letters. Therefore, any word having more than three letters but less than eight letters would be coded as one, etc. This information was coded to aid the programmer in processing the data.

In column six the information was coded as to whether the word was a brief form, brief form derivative, or a regular word to be written out. Column seven was used to indicate whether the form was a special form or word. For example, contraction, abbreviated forms, and intersected forms would be indicated in this column. Column nine was used to indicate how many of the Gregg Shorthand Symbols in the

Diamond Jubilee Series were required to write each of the words. The tenth column was used to code the types of symbols used in writing each word. Symbols were classified as being either alphabetic or principle as defined in Chapter I. (Note: Column eight was left blank for possible expansion of some of the data) The coding of the information in columns six, seven, nine, and ten was completed when the data were compiled for this study, but this information will not be used until this study has been completed.

Columns 11-40 were used for coding each of the symbols used in writing each of the words. The symbols of the Diamond Jubilee Series of Gregg Shorthand were numbered for this study from 001 through 137. This meant that three digits would be needed to indicate each symbol used in writing a word. That is, it was an arbitrary numbering system of the symbols of the Diamond Jubilee Series of Gregg Shorthand. The following is an example of the coding procedure for the word "place" which is written in shorthand by using the symbols for "p," "l," "a," and the left "s." The symbol number given to "p" is 040. The symbol number assigned to "l" is 029. The symbol number given to "a" is 001. The left "s" has the number 044. It would take twelve columns to code this word so in columns eleven through twenty-two the symbols would be coded 040029001044. (See Appendix II for a complete listing of the numbering system for the coding procedure.)

The reason for using a numbering system for the symbols is rather obvious. It is much easier to process data when using the unit record equipment if numbers are used rather than alphabetic data.

Each of the 4,949 words used in this study might be used as one or more parts of speech depending on how it is used in a sentence.

This information was coded in columns 41-49. Column 41 was used when the word or special form could not be classified as a part of speech such as a contraction. Columns 42-49 were used to code the parts of speech. (See Appendix III for the exact design of the coding of this field.) This information concerning the parts of speech will also be used upon the completion of this study.

In columns 50-75 the word was coded alphabetically. Columns 76-80 were used to code the frequency of usage of the word. This refers to the number of times each word was used in the 300,000 words that were examined by Silverthorn.

Checking Accuracy

After all this information was coded for the 4,949 words, the data were checked for accuracy. Particular emphasis was placed upon the first 1,250 words because as Silverthorn noted--over 80 per cent of the total frequency of the 300,000 words was within the first 1,250 words. The procedure used to check the accuracy of the first 1,250 words was to check the data before it was punched and verified. These corrections were noted and another individual checked the accuracy of the suggested corrections, and then these corrections were made.

Processing Data

The cards for the 4,949 words were punched and verified after the coding and corrections were made. Printouts of the word list were obtained and the words were again checked for accuracy. The first set of corrections made on the word list after the cards had been punched and verified were made on green IBM cards. The second set of

corrections were made on red IBM cards. After the correction cards were inserted into the original deck and the cards containing the incorrect data were removed, it could be observed immediately if there were any concentrations of troublesome words to code.

After the final check for accuracy was made, a program was prepared for the IBM 1620 computer to print out the weighted frequency counts for each of the 137 symbols in the Gregg Shorthand System using the Diamond Jubilee Series.

Analysis of Data

After the computer had compiled this data, the symbols were ranked in order beginning with the most frequently used symbol and ending with the least frequently used symbol.

The remaining chapters of this study are devoted to the analyzing of this data and summarizing the significance of this analysis.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study is to analyze the frequency of usage of the Gregg Shorthand Symbols in the most frequently used words in general business communications.

In analyzing this data the following questions will be answered:

1. What will be the order of the symbols when listed in the order of frequency of usage--starting with the most frequently used symbol and ending with the least frequently used symbol?

2. Are all the shorthand symbols used at least one time in writing the "most frequently used words in general business communications?"

3. Do "alphabetic symbols" occur more frequently than do the "principle symbols?"

Order of Symbols by Frequency of Usage

The data will be presented as follows:

1. A table to show the significance of the first ten symbols according to their frequency of usage.

2. A table to indicate the other symbols and their weighted frequency of usage.

3. A table to show the symbols that had a frequency of usage of zero occurrences in the 4,949 most used words.

4. A table to summarize the significance of the frequency of usage of these symbols.

The First Ten Symbols

In Table I the first ten symbols in Gregg Shorthand are listed beginning with the most frequently used symbol in writing the most frequently used words in general business communications. Directly below the listing of these ten symbols is the total weighted frequency of usage of these ten symbols.

TABLE I

FIRST TEN GREGG SHORTHAND SYMBOLS ACCORDING TO THE WEIGHTED FREQUENCY COUNT OF THE 4,949 MOST FREQUENTLY USED WORDS

Order of Frequency	Symbol Sounds	Weighted Frequency*
1	ē, ĕ, ĭ, ẽ, û	72,719
2	r	52,788
3	ā, ă, ä	49,946
4	t	49,718
5	ō, ŏ, aw	42,229
6	o͞o, o͝o, o͡o	39,619
7	s, left	35,569
8	s, comma	34,267
9	n	33,486
10	th	32,130
TOTAL WEIGHTED FREQUENCY FOR THE FIRST TEN SYMBOLS		442,471
PERCENTAGE OF TOTAL WEIGHTED FREQUENCY FOR 137 SYMBOLS		59.41

*The weighted frequency count of the symbols is the number of occurrences of each shorthand symbol in each of the 4,949 words times the frequency of usage of the words in which it is used.

The total weighted frequency count of the ten most frequently used symbols was calculated in order to determine the relationship between the usage of the ten symbols and the usage of the entire 137 symbols. The per cent of the total weighted frequency count comprised of the ten most frequently used symbols was 59.41.

The Symbols 11-133

Table II (pages 26-27) illustrates, in order of frequency of usage, the symbols numbered 11-133. The fact that the first ten symbols represent 59.41 per cent of the total weighted frequency of usage should be kept in mind. The other 123 symbols which have a frequency of usage comprise only 40.59 per cent of the total weighted frequency count.

Twenty-four symbols are used to write at least one word, but they have a weighted frequency of usage of less than 100. This is significant because each of these 24 symbols is used less than 100 times to write each of the 4,949 words in which the symbol occurred multiplied by the number of times the word occurred in the count made by James E. Silverthorn.

The Symbols with Zero Frequency

Table III lists the four symbols which had no frequency of usage in the 4,949 most frequently used words. There was one word beginning symbol that was not used--"dern, derm." Three word ending symbols had a weighted frequency of usage of zero. These three word endings--"burg," "ingham," and "ington"--are used to write proper names.

TABLE II

SYMBOLS 11-133 ACCORDING TO THE WEIGHTED FREQUENCY COUNT

Order of Frequency	Symbol Sounds	Weighted Frequency	Order of Frequency	Symbol Sounds	Weighted Frequency	Order of Frequency	Symbol Sounds	Weighted Frequency
11	l	30,130	31	re-*	3,974	51	-ther	1,152
12	k	25,476	32	ow	3,911	52	oi	983
13	p	24,023	33	con-, com-	3,451	53	den	942
14	m	19,360	34	in-	2,694	54	per-	938
15	d	18,402	35	men, mem	2,458	55	be-	868
16	f	17,498	36	ses	2,277	56	ĭa, ēa	830
17	b	15,089	37	-ment	2,102	57	x	712
18	v	13,937	38	ten	2,095	58	ng	679
19	nd	10,813	39	min, mon, mun	1,961	59	dis-, des-	677
20	ī	9,043	40	rd	1,842	60	-sion	667
21	-ing	7,957	41	tem	1,834	61	inter-, intr-	560
22	w, sw	6,925	42	ū	1,743	62	div, dev	541
23	h	6,117	43	ted	1,685	63	w, dash	455
24	-tion	5,537	44	ld	1,450	64	fur-	436
25	g	5,507	45	ex-	1,354	65	-cial	434
26	j	5,403	46	for-, fore-	1,287	66	ngk	427
27	ch	4,890	47	ded, det, dit	1,267	67	-ort	425
28	sh	4,846	48	de-	1,201	68	under-	424
29	nt	4,060	49	-ble	1,173	69	-tain	414
30	-ly	3,985	50	en-	1,154	70	def, dif	407

*The dash (-) after a symbol sound indicates a word beginning. The dash before a symbol sound indicates a word ending.

TABLE II (continued)

Order of Frequency	Symbol Sounds	Weighted Frequency	Order of Frequency	Symbol Sounds	Weighted Frequency	Order of Frequency	Symbol Sounds	Weighted Frequency
71	wh	394	92	-ily*	202	113	-lty	54
72	un-	379	93	-ward	192	114	over-	52
73	pur-	370	94	-cal	179	115	quent	48
74	-lity	348	95	enter-, entr-	172	116	-thern, -therm	46
75	ah, aw	330	96	di-	169	117	-ciency, -cient	37
76	-gram	323	97	-ulation	166	118	-ingly	34
77	con-, com-**	313	98	trans-	161	119	-ulate	31
78	-ful	312	99	yo, yoo, ye, ya	159	120	tribute	30
79	quire	312	100	-tial	147	121	circum-	28
80	dem	290	101	post-	134	122	ul-	28
81	-ure	284	102	-cle	132	123	thern-, therm-	25
82	ia	275	103	al-	125	124	self-	19
83	-ual	275	104	-rity	116	125	mis-	18
84	sub-	271	105	titute	104	126	electr-	16
85	em-	263	106	super-	95	127	-sume	16
86	-ings	257	107	-self	95	128	-selves	14
87	im-	241	108	z	86	129	-hood	10
88	-ship	240	109	en-, in-, un-**	84	130	em-, im-**	9
89	mt, md	233	110	electric	77	131	-tient	8
90	-tern, -term	216	111	-ification	71	132	-dern, -derm	6
91	ort-	206	112	tern-, term-	67	133	-sumption	4

*The dash (-) after a symbol sound indicates a word beginning. The dash before a symbol sound indicates a word ending.

**A word beginning followed by a double asterisk indicates "when vowel follows."

TABLE III

SYMBOLS WITH ZERO FREQUENCY

Order of Frequency	Symbol Sounds	Weighted Frequency
134	dern-, derm-	0
135	burg	0
136	ingham	0
137	ington	0

Summary Table of Symbols by Frequency of Usage

Table IV (page 29) summarizes the significance of the weighted frequency of usage of the 137 symbols. The symbols are in groups of ten with the exception of the last two groups. The next to the last group contains the last 13 symbols which have a weighted frequency. The last group contains the last four symbols which have a weighted frequency of zero. These symbols have been grouped so that patterns in the relationship--the parts to the whole--may be shown.

In this table the first ten symbols represent 59.41 per cent of the total usage of all the symbols in the most frequently used words in general business communications. The first twenty symbols comprise 84.09 per cent of the total weighted frequency count. After the first forty most frequently used symbols the per cent of the total weighted frequency count is less than 2.00 for each of the remaining groups of symbols. The per cent of the total weighted frequency count comprised of the last 13 symbols is .03.

TABLE IV

SUMMARY TABLE OF SYMBOLS BY FREQUENCY OF USAGE

Symbols	Weighted Frequency	Per Cent of Weighted Frequency	Total Weighted Frequency	Total Per Cent of Weighted Frequency
1-10	442,471	59.41	442,471	59.41
11-20	183,771	24.68	626,242	84.09
21-30	55,227	7.42	681,469	91.51
31-40	26,765	3.59	708,234	95.10
41-50	14,148	1.90	722,382	97.00
51-60	8,448	1.13	730,830	98.13
61-70	4,523	.61	735,353	98.74
71-80	3,371	.45	738,724	99.19
81-90	2,555	.34	741,279	99.53
91-100	1,753	.24	743,032	99.77
101-110	1,048	.14	744,080	99.91
111-120	470	.06	744,550	99.97
121-133	201	.03	744,751	100.00
134-137	0	.00	744,751	100.00

Usage of Alphabetic and Principle Symbols

The presentation of the data concerning the usage of the alphabetic and principle symbols is shown in Table V. The 28 alphabetic symbols (20.44 per cent of the 137 symbols) represent only about one-fifth of the total number of symbols. The per cent of the total weighted frequency count comprised of these 28 symbols is 87.33. The per cent of the total weighted frequency count comprised of the 109 principle symbols is 12.67.

TABLE V

ALPHABETIC AND PRINCIPLE SYMBOLS
PERCENTAGE OF USAGE ACCORDING
TO WEIGHTED FREQUENCY COUNT

Type of Symbol*	Number	Per Cent of 137 Symbols	Weighted Frequency	Per Cent of Weighted Frequency
Alphabetic	28	20.44	650,370	87.33
Principle	109	79.56	94,381	12.67
TOTAL	137	100.00	744,751	100.00

*See Appendix I for a complete listing of the alphabetic and principle symbols as used in this study.

The facts concerning the frequency of usage of the 137 symbols in Gregg Shorthand will be summarized in Chapter V.

CHAPTER V

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

The purpose of this study was to analyze the frequency of usage of the Gregg Shorthand Symbols in the most frequently used words in general business communications.

The related literature examined for this study included the history of shorthand in the English language, studies of difficulties in the teaching and learning of Gregg Shorthand, and psychology of skills as related to shorthand. The purposes of this approach were to determine the background of all shorthand systems, to understand problems of the various shorthand systems, and to recognize the purpose of the shorthand skill. As a result of this research, the following points were deemed important in achieving the purpose of this study:

1. What will be the order of the symbols when listed in the order of frequency of usage--starting with the most frequently used symbol and ending with the least frequently used symbol?

2. Are all the shorthand symbols used at least one time in writing the "most frequently used words in general business communications?"

3. Do "alphabetic symbols" occur more frequently than do the "principle symbols?"

Summary of Findings

On the basis of this study, the following is a list of findings:

1. The per cent of the total weighted frequency comprised of the ten most frequently used symbols was 59.41.

2. The per cent of the total weighted frequency comprised of the other 123 symbols having a frequency was 40.59.

3. Twenty-four symbols were used to write at least one word, but each had a weighted frequency of less than 100.

4. Four symbols had a zero weighted frequency. These four symbols consisted of one word beginning symbol ("dern, derm") and three word endings ("burg," "ingham," and "ington").

5. The per cent of the total weighted frequency count comprised of the twenty most frequently used symbols was 84.09.

6. The per cent of the total weighted frequency count comprised of each of the groups of symbols after the first 40 most frequently used symbols was less than 2.00.

7. The per cent of the total weighted frequency comprised of the thirteen least frequently used symbols was .03.

8. The per cent of the total weighted frequency comprised of the 28 alphabetic symbols was 87.33.

9. The per cent of the total weighted frequency comprised of the 109 principle symbols was 12.67.

Conclusions

As a result of the findings of this study, the following conclusions were made:

1. The four symbols ("dern and derm," "burg," "ingham," and "ington") which had a zero weighted frequency do not need to be introduced to write the 4,949 most frequently used words in general business communications.

2. The alphabetic symbols have a very high weighted frequency (87.33 per cent) in writing the 4,949 most frequently used words.

3. The principle symbols have a low weighted frequency (12.67 per cent) in writing the 4,949 most frequently used words.

4. On the basis of the ranking of these symbols, a revision of the method of presenting the theory of the Gregg Shorthand in the Diamond Jubilee Series is possible.

5. In any experimental method of presenting the theory of Gregg Shorthand in the Diamond Jubilee Series, the 10 most frequently used symbols need maximum emphasis.

6. The listing of the symbols by frequency of usage is a basis upon which the educator may stress the importance of each of the symbols.

Recommendations

The following recommendations are made:

1. A study should be made to determine whether the theory of Gregg Shorthand in the Diamond Jubilee Series should be presented in the order of importance.

2. There should be more emphasis placed on the symbols which are the most frequently used when the theory of Gregg Shorthand is taught. The fact that the less frequently used symbols are also needed to write many of the words cannot be overlooked. However, if the "alphabetic symbols" are known well, this would allow more time for the student to recall the less frequently used symbols.

3. The introduction of the symbol "dern, derm" (word beginning) should be reevaluated. This symbol is introduced in the Gregg textbook, high school and college, without giving any examples.

4. The three word endings--"burg," "ingham," and "ington"--had a zero frequency in the 4,949 most frequently used words. These symbols are important for use in writing cities and states and probably should remain in the theory of the system.

5. This study was made to determine the frequency of usage of the shorthand symbols without regard to the specific sounds of the symbols. The symbol for "e" was used to write the sounds $\bar{e}$, $\breve{e}$, $\breve{i}$, $\tilde{e}$, and $\hat{u}$. A worthwhile study would be to determine the frequency of usage of each of the phonetic sounds. This would provide a basis for the development of a shorthand presentation that would be even more like the actual use of taking shorthand on the job.

The learning experience should be, as much as possible, like the actual use of the skill on the job. As a result of this study, a logical method of presenting the theory of Gregg Shorthand may be developed which will better meet the needs of the learner of the skill.

BIBLIOGRAPHY

Books

Burton, William H., The Guidance of Learning Activites, D. Appleton-Century Company, New York, 1944.

Gates, Arthur I., The Improvement of Reading, The Macmillan Company, New York, 1936.

Glatte, H., Shorthand Systems of the World, Philosophical Library, New York, 1959.

Gregg, John R., Louis A. Leslie, and Charles E. Zoubek, Gregg Shorthand Dictionary, McGraw-Hill Book Company, New York, 1963.

Holst, Alice L., A Self-Teaching Manual on College Note Taking With the Aid of Shorthand, Columbia University, New York, 1956.

Leslie, Louis A., Methods of Teaching Gregg Shorthand, McGraw-Hill Book Company, New York, 1953.

Leslie, Louis A., The Story of Gregg Shorthand, McGraw-Hill Book Company, New York, 1964.

Russon, Allien R. and S. J. Wanous, Philosophy and Psychology of Teaching Typewriting, Southwestern Publishing Company, Cincinnati, 1960.

Dissertations and Theses

Chapman, Frances C., "A Comparison of the Memory Load of the Anniversary and Simplified Editions of Gregg Shorthand," Doctor's thesis, University of Pittsburgh, 1951.

Crowley, Jean F., "A Study of the Problems and Their Solution in Teaching Shorthand Transcription in Massachusetts," Master's thesis, Boston University, 1949.

Danielson, Harriet A., "The Relationship Between Competency in Shorthand Vocabulary and Achievement in Shorthand Dictation," Doctor's dissertation, Indiana University, 1959.

Ferris, Beatrice M., "A Study of the Learning Difficulties of High School Shorthand Students," Doctor's dissertation, University of Southern California, 1947.

Flood, Hazel A., "Some Factors Involved in Learning Shorthand--Analysis of the Learning Load of Two Systems of Shorthand," Doctor's dissertation, University of Minnesota, 1953.

Hillestad, Mildred C., "Factors Which Contribute to the Difficulty of Shorthand Dictation Materials," Doctor's dissertation, University of Minnesota, 1960.

Jester, Donald D., "A Time Study of the Shorthand Transcription Process," Doctor's dissertation, Northwestern University, 1959.

Silverthorn, James E., "The Basic Vocabulary of Written Business Communications," Doctor's dissertation, Indiana University, 1955.

Periodicals

Gregg, John R., Louis A. Leslie, and Charles E. Zoubek, Gregg Shorthand Diamond Jubilee Series, A Presentation of System Changes, McGraw-Hill Book Company, New York, 1963, 29 pp.

Richards, Ralph J., "A Comparison of Current Shorthand Systems, Using Silverthorn's High-Frequency Word List," National Business Education World, October, 1967, p. 62.

Shaffer, Laurance F., "The Functions of Measurement," Business Education World, March, 1938, pp. 544-546.

Stolurow, Lawerence M., "The Psychology of Skills," Delta Pi Epsilon Journal, April, 1959, p. 29.

APPENDIX

APPENDIX I

Alphabetic and Principle Symbols

Alphabetic		Principle*	
1.	ā, ă, ä	2.	ah, aw
3.	ē, ĕ, ĭ, ẽ, û	5.	īa
4.	ī	6.	ĭa, ēa
7.	ō, ŏ, aw	8.	ow
10.	o͞o, o͝o, o͞o	9.	oi
12.	w, sw	11.	ū
14.	w, dash	13.	wh
16.	b	15.	yo, yoo, ye, ya
17.	ch	19.	ded, det, dit
18.	d	20.	def, dif
24.	f	21.	dem
25.	g	22.	den
26.	h	23.	div, dev
27.	j	30.	ld
28.	k	32.	men, mem
29.	l	33.	min, mon, mun
31.	m	34.	mt, md
35.	n	36.	nd
40.	p	37.	ng
41.	r	38.	ngk
43.	s, comma	39.	nt
44.	s, left	42.	rd
46.	sh	45.	ses
47.	t	48.	ted
51.	th	49.	tem
52.	v	50.	ten
53.	x		
54.	z		

*All word beginnings and word endings are principles--in addition to the ones listed.

APPENDIX II

Numbering of Symbols

Symbol Number	Symbol	Symbol Number	Symbol
001	ā, ă, ä	036	nd
002	ah, aw	037	ng
003	ē, ĕ, ĭ, ẽ, û	038	ngk
004	ī	039	nt
005	īa	040	p
006	ĭa, ēa	041	r
007	ō, ŏ, aw	042	rd
008	ow	043	s, comma
009	oi	044	s, left
010	o͞o, ŭ, o͝o	045	ses
011	ū	046	sh
012	w, sw	047	t
013	wh	048	ted
014	w, dash	049	tem
015	yo, yoo, ye, ya	050	ten
016	b	051	th
017	ch	052	v
018	d	053	x
019	ded, det, dit	054	z
020	def, dif	055	al-
021	dem	056	be-
022	den	057	circum-
023	div, dev	058	con-, com-
024	f	059	con-, com-*
025	g	060	de-
026	h	061	dern-, derm-
027	j	062	di-
028	k	063	dis-, des-
029	l	064	electr-
030	ld	065	electric
031	m	066	em-
032	men, mem	067	em-, im-*
033	min, mon, mun	068	en-
034	mt, md	069	en-, in-, un-*
035	n	070	enter-, entr-

*When followed by a vowel

APPENDIX II (continued)

Symbol Number	Symbol	Symbol Number	Symbol
071	ex-	106	-ingham
072	for-, fore-	107	-ingly
073	fur-	108	-ings
074	im-	109	-ington
075	in-	110	-lity
076	inter-, intr-	111	-lty
077	mis-	112	-ly
078	ort-	113	-ment
079	over-	114	-ort
080	per-	115	-rity
081	post-	116	-self
082	pur-	117	-selves
083	re-	118	-ship
084	self-	119	-sion
085	sub-	120	-sume
086	super-	121	-sumption
087	tern-, term-	122	-tain
088	thern-, therm-	123	-tern, -term
089	trans-	124	-ther
090	ul-	125	-thern, -therm
091	un-	126	-tial
092	under-	127	-tient
093	-ble	128	-tion
094	-burg	129	-ual
095	-cal	130	-ulate
096	-cial	131	-ulation
097	-ciency, -cient	132	-ure
098	-cle	133	-ward
099	-dern, -derm	134	tribute*
100	-ful	135	quent*
101	-gram	136	quire*
102	-hood	137	titute*
103	-ification		
104	-ily		
105	-ing		

*families

APPENDIX III

Shorthand Coding Guide

Columns

1-4 The number of the word

5 The number of letters in each word by groups of four

1 thru 3 = 0
4 thru 7 = 1
8 thru 11 = 2
12 thru 15 = 3
16 thru 19 = 4
20 thru 23 = 5

6 How the word is written

1 = written according to theory
2 = written as a brief form
3 = written as a brief form deriviative

7 Special words

1 = contractions
2 = abbreviated forms
3 = intersected forms

8 Nothing coded

9 Number of symbols used to write the word

10 What was involved to write the word

1 = all alphabetic
2 = alphabetic and principle
3 = alphabetic and brief form
4 = principle and brief form
5 = all principle
6 = alphabetic, principle, and brief form

APPENDIX III (continued)

Columns

11-40 Coding the symbols used to write the word

41 For the words that cannot be classified as a part of speech

42 Noun (if the word can be used as a noun--may be more than one part of speech)

43 Pronoun

44 Verb

45 Adjective

46 Adverb

47 Preposition

48 Conjunction

49 Interjection

50-75 Coding the word alphabetically

76-80 Coding the frequency of usage of the word