To the Graduate Council:

I am submitting herewith a thesis written by Linda Huddleston Ousley entitled "The Pacing of Transcription with Slides in Century 21 Shorthand." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Business Education.

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THE PACING OF TRANSCRIPTION WITH SLIDES IN CENTURY 21 SHORTHAND

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Linda Huddleston Ousley

August 1978

1363968

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I would like to dedicate this thesis to the memory of my mother, Lois Elaine Majors Huddleston, whose 22 years of teaching and inspiring students gave me great encouragement. My father's unfailing support throughout the completion of my degree is very much appreciated.

To my advisor, Dr. E. Ray Smith, and the other members of my committee, Professor George Wagoner and Dr. Donald Hampton, I express my sincere thanks for their assistance, encouragement and patience.

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Acknowledgment is made of the contributions made by the students utilized in the study who were enrolled in Century 21 Shorthand at The University of Tennessee, Knoxville.

To my husband, Lea, I express my thanks for all the hours of encouragement and help during the writing and typing of this thesis.

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ABSTRACT

The purpose of this study was to pilot-test a pacing technique using a set of slides for teaching transcription in a second-quarter Century 21 Shorthand class at The University of Tennessee, Knoxville.

Students were given pre-tests (to measure levels of achievement) consisting of a five-minute timed writing; a transcription from shorthand plate test; and a dictation test at 60, 70 and 80 words a minute. The researcher then used pacing slides in practice sessions for 20 minutes a day, twice a week for five weeks. At the end of this period the same pre-test was given as a post-test to the same students. The data gathered during the study were analyzed by use of the Wilcoxon test and the Spearman rho rank difference correlation. The Wilcoxon test was used to determine if the slide method had a positive result on student achievement in transcription. The Spearman rho rank difference correlation was used to determine the correlation between student achievement on ACT English and student achievement in transcription during the study.

Major conclusions reached in the study were:

1. The use of the slide technique results in an improved student transcription ability when transcribing from their own notes.

2. The use of the slide technique results in an improved student transcription rate when transcribing from shorthand plate material.

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CHAPTER I

INTRODUCTION

Because of the importance of the shorthand transcript to every business, business educators must be concerned with the most effective method of instructing students in the "art" of transcribing. As stated by Wanous and Whitmore[1] ". . .efficient transcription is the ultimate aim of shorthand study." Efficient transcription includes both rapid and accurate transcription.

The major factors of the transcription "art" are the writing of readable shorthand outlines, improvement of typewriting techniques, coordination of reading and typing from shorthand notes, the application of a knowledge of English grammar and punctuation, the proofreading process, and the arrangement and handling of materials.[2] The complexity of the transcription process demands a well-organized program of transcription teaching in the classroom.

In recent years, the most common method of teaching transcription has involved the dictation of letters or other material to the student who then proceeded to transcribe from his/her notes as much as possible within a certain time limit. This method gives the student practice in typing from his/her own shorthand. However, by allowing the student to pause throughout the transcription process, this method fails to

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[1] S.J. Wanous and Irol V. Whitmore, "Transcription Teaching Aids and Devices," The Balance Sheet, Vol. 24, (September, 1942), pp. 8-10.

[2] S.J. Wanous and Irol V. Whitmore, "Consider the Principal Factors That Affect the Development of Transcription Skill," The Balance Sheet, Vol. 23, (May, 1942), pp. 396-398.

insure that the student progresses at a satisfactory rate when transcribing.

The Jester study[3] found that 61.9 percent of the overall time (of transcription) was devoted to numerous non-typewriting activities. This amount of time needs to be reduced by emphasis on the writing of correct shorthand outlines, usage of good English grammar, proofreading, and arranging and handling materials efficiently. In order to have more time to work on these facets during the act of transcribing, the student needs to learn the complex process of producing a final copy from shorthand outlines with as few pauses as possible. How can learning of this "fluent transcription with minimum pauses" be facilitated?

I. PURPOSE OF THE STUDY

The purpose of the study was to pilot-test a pacing technique using a set of slides for teaching transcription in a second-quarter Century 21 Shorthand class at The University of Tennessee, Knoxville.

To accomplish this purpose, answers were sought to the following questions:

1. What changes occurred in the transcription rates of students using the slide technique during the transcription skill building as measured by student performance on a pre-test and post-test of shorthand plate material?

2. What changes occurred in the transcription rates of students using the slide technique during the transcription skill building as

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[3]Don Jester, "We Can Improve Transcription by Learning How the Transcriber's Time is Split Up," Business Education World, Vol. 42, (January, 1962), pp. 12-15.

measured by student performance on 3 three-minute dictated pre-tests at 60, 70, and 80 words a minute and 3 three-minute dictated post-tests at 60, 70, and 80 words a minute?

3. How does the performance of students of differing abilities compare?

4. How does the change in typing rate compare with the change in transcription rate during this period of time?

5. What are the reactions of students to the use of shorthand slides?

II. NEED FOR THE STUDY

Rapid and accurate transcription is the final goal of any shorthand student; therefore, the two aims of transcription are speed of production and mailable copy.[4] To achieve these aims, the major problems to the learner of transcription techniques must be considered. One of the most difficult transcription skills is that of reacting to the visual stimuli of shorthand outlines with translation into typewritten words.

Jester[5] found that the transcriber pauses much too frequently during the transcription period. For example, he found that "the typical transcriber spends only 38 percent of her time in the typing activity, that of actually striking the keys of the typewriter in a fairly rapid and continuous pattern." He further states that she

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[4]S.J. Wanous and Irol V. Whitmore, "Consider the Principal Factors," p. 396.

[5]Don Jester, "We Can Improve Transcription," pp. 12-15.

"types for only very short intervals of time without some interruption or change of activity." Thus, 68 percent of the time is spent with non-typing activities including erasing, proofreading, correcting, reading shorthand notes for context and meaning, dealing with spelling, and handling materials. The present study is concerned with a technique which could possibly reduce the time for non-typing activities and, thereby, provide an increased time for the typing activity--thus a more efficient transcription process.

Liles[6] states that "if the transcriber could keep the typewriter moving along steadily and uninterruptedly, the problem of satisfactory transcription rate would practically disappear." He also attributed low transcription speed to the teacher's approach to the transcription process. Liles emphasizes the importance of timing the transcription when he states:

> . . .Failure to time transcription is also a contributing factor. The student must be made to feel that everything she transcribes is timed and that she must constantly show a gain in speed. Otherwise she soon reaches a standstill, and careless and slovenly habits are developed that are difficult to overcome later.[7]

The use of some type of pacing device such as the one used in the current study should force the student to respond continuously to the stimuli without regard to error or lack of knowledge. In this manner, the student will build speed of transcription first so that he/she can then work for control (accuracy). Research should be conducted to determine effective pacing procedures for the development of transcription ability.

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[6]Parker Liles, "We Should Increase Transcription Speed," Business Education World, Vol. 42, (June, 1962), pp. 12-14, 34.

[7]Ibid.

McGuire's study utilized practice sessions (over a period of several weeks) in which students were paced through the use of slides. McGuire found that pacing had a "Positive effect on transcription" with respect to transcription speed and reduction of errors.

The present study is similar to McGuire's in that students were paced by use of slides. The use of slides for pacing greatly lessens the opportunity for students to pause because the transcriber's eyes are focused on the screen at the front of the room. This study utilizes Century 21 Shorthand instead of Gregg as in McGuire's. Since the material could have an effect on student progress, simpler material was used in the current study. Material in the McGuire study had been created for theory review and not for the transcription process--thus the more difficult type material could have caused the lack of progress for the experimental groups. Student responses indicated this technique to be highly satisfactory.

III. LIMITATIONS

The limitations of the study were as follows:

1. The study was limited to one second-quarter Century 21 Shorthand class at The University of Tennessee during the Winter Quarter of 1977. Twenty-two students participated in the study.

2. Measurement was limited to the students' transcripts of three shorthand pre-tests and three shorthand post-tests and a five-minute straight-copy typewriting pre-test and post-test.

IV. METHODS OF PROCEDURE

The purpose of this study was to pilot-test a pacing technique using a set of slides for teaching transcription in a second-quarter Century 21 Shorthand class of 22 students at The University of Tennessee, Knoxville. A pre-test was given to all students during the fifth week of the quarter. During the 6th, 7th, 8th, and 9th weeks, students participated in two 20-minute practice sessions a week. Practice sessions included reading and transcribing from slides prepared by the researcher and shown at a precise rate. After four weeks of practice sessions, a post-test was administered.

The following sections describe the procedures used in this study. The procedures have been divided by topic as follows: Pre-Test/Post-Test; Slides; and Practice Sessions.

Pre-Test/Post-Test

A pre-test was given to all students in the second quarter of Century 21 Shorthand which included transcripts from three 3-minute dictations at each of the speeds of 60, 70, and 80 words a minute; a 20-minute transcription test from shorthand plates; and a 5-minute straight-copy typewriting test. Students were allowed 12 minutes to transcribe from the dictation at 60, 70, and 80 words a minute. All pre-test material was adapted from McGuire's study except the 70 wam dictation which was not used in her study. The dictation material for the 70 wam was a University of Tennessee Departmental speed test. Copies of pre-test and post-test materials are included in Appendix A.

After four weeks of practice sessions, the same pre-test was administered to the students as a post-test. Timed writings for the pre-tests and post-tests were obtained from Century 21 Typewriting by South-Western Publishing Company. Material for the duplicated plate portion of the pre-tests and post-tests were taken from the high school edition of Century 21 Shorthand published by South-Western Publishing Company.

Slides

Using materials from the Self-Paced Learning Activities manual (in connection with the high school edition of Century 21 Shorthand) by South-Western Publishing Company, the researcher developed eight sets of shorthand slides for the study. A different passage consisting of approximately 160 standard typewritten words was used for each set of 20 slides. Shorthand outlines for these passages were placed on cards which were photographed for slides. A sample slide is shown in Appendix A.

After marking the passage into standard typewritten words (five strokes), each slide was made with three varying line-lengths to allow for differing transcription rates as follows:

1. Top Line--shorthand outlines for eight standard typewritten words
2. Middle Line--shorthand outlines for seven standard typewritten words
3. Bottom Line--shorthand outlines for six standard typewritten words

Each line began at a different point in the passage; in this manner, material on each line of each slide was different. The student could not change to a slower speed to finish a sentence but had to keep transcribing from that line--forced to keep going at that particular rate. Additional material was included for the higher speeds that was not in the lower speeds, but this material was taken from the same lessons. (Note about type of material: theory was learned earlier; by this time of the quarter, material was familiar and presented no difficulty to students.)

The descending rate order of line-lengths was chosen so that the student was moving "up" each time he/she succeeded. When the completed slides were shown at 15-second intervals, each slide paced the students at 32-, 28-, and 24-words per minute, respectively. At the end of all even-numbered slides, a red double-bar (||) signaled students to return the typewriter carriage. In this manner, the students were kept typing within the margins of their paper.

Practice Sessions

Practice sessions were 20 minutes in length, twice a week, for the sixth through the ninth weeks of Winter Quarter, 1977. Each session followed a similar format. In order for students to familiarize themselves with the content of the slides, the entire set of slides was first read in unison by the students with the researcher leading the unison reading and prompting when necessary. If students seemed to read slowly, the slides were repeated with unison reading. During the first practice session only, all students typed from the bottom line.

From then on, students were able to progress "upward" to a new line on the slide according to how well he/she had done on the previous transcription practice session.

Slides were shown automatically at 15-second intervals with the Carousel 800 projector while students transcribed the assigned line--bottom, middle, or top--of shorthand outlines. The purpose of the first showing was to increase transcription rates of the students. In later sessions, a second showing of the slide set was included in each session to get students to strive for accuracy of transcription.

A regular class of second-quarter shorthand at The University of Tennessee was used for the research study. Of the 28 students who were enrolled, 22 were included in the study. Six students were absent for either the pre-test or post-test and were not included in the study.

Each student's practice transcript was evaluated after each session by the researcher. At the beginning of each session after the first one, each student was instructed as to whether she should move "up" to the next line on the slide according to how well she had done in the previous session.

The researcher's evaluation included the scoring of all papers following each pacing session. A cut-off point of ten errors (excluding punctuation), established arbitrarily by the researcher, was used to determine when the student was instructed to attempt a higher level of transcription pacing.

All of the first sessions were conducted without the use of any correction devices by the students. After completing the highest level of pacing within the cut-off point without using correction

devices, the student was then instructed to complete the next pacing session transcribing from the bottom line of the slides and using some type of correction device. These transcripts were then checked according to the same cut-off level.

Data from the pre-test and post-test were analyzed using the Spearman rank order correlation and Wilcoxon test to determine if the slide method of teaching transcription had a positive result on student achievement in transcription. The interpretation of the analysis is presented in Chapter II of this report.

V. REVIEW OF RELATED LITERATURE

Literature on shorthand was examined for research utilizing pacing materials and analyzing transcription. Only those studies closely related in purpose or procedures to the present study were included. The studies are presented in alphabetical order.

Barber Study

The purpose of the Barber[8] study was to determine whether tachistoscopic training would aid in the teaching of shorthand.

Seventy-nine students were selected at random to participate in the study and randomly divided into experimental and control groups. The study was conducted during the fall, winter, and spring quarters of three consecutive years. With the exception of the tachistoscopic training in the experimental groups, teaching procedures were the same

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[8]Shirley Barber, "The Effectiveness of Tachistoscopic Training in Collegiate Elementary Shorthand," (unpublished Doctoral dissertation, Colorado State College, 1961).

in both experimental and control classes each day. The only difference between the control and experimental groups was the use of the tachistoscope as a visual aid in the experimental class and the use of the chalkboard as a visual aid in the control class.

Snedecor's F-test was used to determine whether the samples were drawn from populations with homogeneous variances; and a Student's t-test was computed on each criterion (gross errors, transcription rate, and reading rate) to determine the significance of the difference between the two means.

The major findings of this study were as follows:

1. The experimental groups transcribed 4.19 correct words a minute faster than the control groups over the total three-year period.

2. There is a significant difference at the .01 level in the reading rates on all types of material when one group receives tachistoscopic training and the other does not. The experimental groups had higher reading rates on all types of material than the control groups.

3. There is a significant difference at the .01 level in transcription rates of text material when one group receives tachistoscopic training and the other does not. The experimental groups had higher transcription rates than the control groups.

4. There is a significant difference at the .01 level in the speed of transcribing dictated material from written notes, regardless of the rate of dictation speed or the length of the test when one group receives tachistoscopic training and the other does not. The experimental groups had higher rates of transcription speed on all measurements.

Barber concluded that the use of the tachistoscope as a visual aid in teaching had a positive effect on reading rates of all types of material, number of errors on word list tests and transcription speed of dictated material.

The Barber study and the present study are related in that both studies implemented pacing devices in an effort to increase transcription speed and accuracy. Students in the present study read from shorthand material projected by slides, whereas the students in the Barber study read from material projected by the tachistoscope. Transcription by students in the Barber study was done in longhand while transcription in the present study was done on the typewriter.

Jester Study

The purpose of the Jester[9] study was to describe and define the transcription process in such a way that some improvement in transcription training could be identified. The study identified the major components of the overall process, the activities involved in the process, the problems of transcription, and how transcribers solve those problems.

Time-study technique was selected for use in this research project. Students were video-taped by the researcher and observed for analysis of their transcription efforts during the study. Five letters were dictated to each of 36 transcribers in a simulated office situation. All letters were dictated at 80 words a minute. Out of the 36 students participating, 20 were college students, 13 were high school students, and three were students in an adult evening program. All transcribers had some work experience.

The major findings of Jester's study were as follows:

1. Only 38.1 percent of the overall time of transcription is devoted to the typing activity; whereas, 61.9 percent of the overall time is devoted to numerous non-typing activities.

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[9]Donald D. Jester, "A Time Study of the Shorthand Transcription Process," (unpublished Doctoral dissertation, Northwestern University, 1959).

2. The duration of the time interval of typing activity was less than 30 seconds for 92.9 percent of the typing time intervals in this study. Only 6.3 percent of the typing time intervals were as long as 60 seconds, one minute, in duration.

3. The ten major non-typing activities and their percent of time consumed were as follows:

    1. erasing and correcting--16.8 percent
    2. proofreading and correcting--7.5 percent
    3. deciphering incorrect shorthand outlines--6.2 percent
    4. reading shorthand notes for context and meaning--5.1 percent
    5. making ready--3.9 percent
    6. dealing with spelling problems--3.8 percent
    7. deciphering poor shorthand penmanship--3.3 percent
    8. supplying and verifying inside addresses--3.0 percent
    9. supplying miscellaneous fill-in information--2.5 percent
    10. dealing with tabulation problems--1.7 percent

Jester concluded that training in non-typing activities must be included in the teaching of transcription.

The present study and the Jester study are related in that both studies are concerned with transcription speed. Jester analyzed all phases of transcription process, whereas the present study attempts to increase the amount of time spent in typing by use of pacing.

McGuire Study

The purpose of the McGuire[10] study was to determine the effectiveness of shorthand slides in accelerating shorthand transcription speed and in improving accuracy of student transcripts in Gregg shorthand.

A total of 78 students participated in the study--35 control and 43 experimental students. All students were regular students (non-repeaters)

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[10]Gertrude M. McGuire, "Pacing Transcription with Shorthand Slides: The Effect on Speed and Accuracy," (unpublished Doctoral dissertation, The University of Tennessee, 1970).

in second and third quarters of shorthand at The University of Tennessee. In the experimental classes, twelve sets of 60 shorthand slides each were administered. Each slide consisted of three lines of paced material and was shown every 15 seconds. At this rate, the student typing from the top line typed at 40 wam, from the middle line at 32 wam, and from the bottom line at 24 wam. These slides were administered twice a week for six weeks. Excluding the slide presentations, the control group followed the same basic lesson plans as the experimental group. Their transcription practice was from shorthand plate material instead of from the slides.

Data were collected by means of pre-tests and post-tests. These consisted of both dictated material at 60 wam, transcription from plate material, and a straight-copy timed writing. The tests were marked for gross words a minute transcribed, and errors were classified as shorthand or non-shorthand errors. Analysis of covariance and the t-test were used for statistical treatment of the data.

The major findings of this study were as follows:

1. There were significant differences between classes using the shorthand slides to pace transcription and the classes taught without the shorthand slides with respect to non-shorthand errors in the transcripts from shorthand plate material on a 20-minute test at the end of shorthand speed building the second quarter of shorthand.

2. Eighty-four percent of the experimental students gave favorable responses to the use of the shorthand slides for increasing transcription speed and accuracy.

3. The post-test correlations between straight-copy typewriting speed and transcription speed from students' shorthand notes were marked to high (.61, .68, and .89) for the experimental classes and low (.12 and. .54) for the control classes. The post-test correlations between straight-copy typewriting

> speed and transcription speed from plate material were substantial to high (.74, .75, and .87) for the experimental classes and low (.42 and .30) for the control classes.

McGuire concluded that the use of shorthand slides for pacing transcription had a positive effect on transcription accuracy with respect to non-shorthand errors.

The present study and the McGuire study were related in that both were studies concerning the utilization of shorthand slides for pacing of transcription. The McGuire study utilized Gregg Shorthand, whereas the present study used Century 21 Shorthand.

VI. DEFINITION OF TERMS

The following definitions explain the terms used in this study:

Shorthand plate material refers to the reproduced copy of shorthand outlines used by the researcher from which students transcribed. The material from which students transcribed for 20 minutes on pre-test and post-test was shorthand plate material.

Carousel 800 slide projector refers to the Eastman Kodak slide projector used as a pacing device during this study. The automatic timer projects slides at 5, 8 or 15 second intervals. The projector uses 2 by 2-inch slides.

Shorthand slides refer to the 2 by 2-inch slides utilizing three speed levels (6, 7 and 8 five-stroke words per slide) of shorthand. Each set contained 20 slides. The three speed levels in each set utilized essentially the same material with the paragraphs arranged in a different order for each level. The higher speed levels contained additional material.

Transcribed words refers to the words the student was able to type from his/her own shorthand notes taken from dictation at 60, 70, and 80 words a minute. No deduction in word count was made for typographical errors.

VII. ORGANIZATION OF THE STUDY

This study is organized in the following manner:

In Chapter I, the introduction, purpose of the study, need for the study, limitations, methods of procedure, review of related literature, definition of terms, and organization of the study are given.

In Chapter II, the analysis of results are presented.

In Chapter III, the summary, conclusions, and recommendations are described.

The Bibliography lists references utilized by the researcher. The appendices contain copies of all dictation material used in testing; shorthand plate material used in testing; timed writing material used in testing; and an example of how calculations were done in analyzing the results of the tests. A sample slide is also included in the appendices.

CHAPTER II

ANALYSIS OF RESULTS

The purpose of the study was to pilot-test a pacing technique using a set of slides for teaching transcription in a second-quarter Century 21 Shorthand class at The University of Tennessee, Knoxville.

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

1. What changes occurred in transcription rates of students using the slide technique as measured by testing with plate material?

2. What changes occurred in transcription rates of students using the slide technique as measured by dictation testing?

3. How does performance of students of differing ability compare?

4. How does change in typing rate compare with change in transcription rate?

5. What are the reactions of students to the use of slides?

During the actual study, 22 students in a second-quarter Century 21 Shorthand class were given a pre-test to measure levels of achievement in shorthand by means of a five-minute timed writing, a transcription from shorthand plate test, and a dictation test at 60, 70, and 80 words a minute. The researcher then used pacing slides in practice sessions for 20 minutes, twice a week for five weeks. At the end of this period, the same pre-test was given as a post-test to the same students. Because one student's results on the post-test were so far out of line, her scores were eliminated from the analysis; thus, a total of 21 student scores were used for analysis purposes. The data gathered during this study

were analyzed by use of the Spearman rho rank difference correlation and the Wilcoxon test.

Transcription Rates of Students on Shorthand Plate Material.

In order to determine the changes in student achievement, a pre-test and post-test were administered to the students in which they were allowed 20 minutes to transcribe from shorthand plate material.

Using the same shorthand plate material during the pre-test and post-test, students were given 20 minutes to transcribe as much as possible at the typewriter. This plate material is shown in Appendix A.

Table I shows the correct words transcribed and the transcription time on both pre-test and post-test from plate material for all 21 students. As shown in Table I, the mean correct words transcribed on the pre-test was 164.5; on the post-test, 163.9. The highest number of correct words transcribed on the pre-test was 171; on the post-test, 171. The lowest number of correct words transcribed on the pre-test was 135; on the post-test, 128. The mean transcription time on the pre-test was 16.5; on the post-test, 11.82. The highest transcription time on the pre-test was 20 (the maximum allowed); on the post-test, 17.75. The lowest transcription time on the pre-test was 13.5; on the post-test, 7.5.

Null Hypothesis No. 1: There is no difference in the number of words correctly transcribed from shorthand plate material on the pre-test and post-test.

Using the data in Table I, the researcher utilized the Wilcoxon test (as shown in Table A-1 in Appendix C) to calculate the significance

TABLE I

WORDS TRANSCRIBED AND TRANSCRIPTION TIMES ON PRE-TEST AND POST-TEST FROM PLATE MATERIAL

Student Number	Pre-Test		Post-Test	
	Correct Words	Transcription Time (In Min.)	Correct Words	Transcription Time (In Min.)
1	169	17.0	167	13.25
2	171	13.5	167	10.50
3	164	16.0	165	11.75
4	169	17.5	168	13.25
5	163	18.5	165	15.50
6	171	16.0	171	7.50
7	162	18.5	168	11.00
8	135	20.0	158	17.00
9	162	18.0	166	10.50
10	167	16.5	166	11.00
11	165	18.5	164	13.75
12	170	13.5	171	8.50
13	167	15.5	171	9.75
14	162	18.0	159	14.00
15	166	15.0	128	11.75
16	152	20.0	161	9.75
17	171	13.5	169	14.00
18	168	13.5	170	9.00
19	161	18.0	156	17.75
20	169	14.5	162	10.50
21	170	14.0	170	8.25
Mean	164.5	16.5	163.9	11.82

*T=95.0 Correct Words (not significant at .05 level with an N of 19)

*T=2.0 Transcription Time (significant at .05 level with an N of 21)

of the difference between the correct words transcribed on the pre-test and those transcribed on the post-test. The use of the Wilcoxon test resulted in a T of 95. With an N of 19 and the .05 level of significance, a tabled T (two-tailed) of 46 or less was needed in order to reject the null hypothesis.[11] Therefore, since the T was 95, the null hypothesis of no difference in the number of words correctly transcribed on pre-test and post-test from plate material was accepted. This indicated that the students did not have a major increase or decrease in the number of words correctly transcribed from pre-test to post-test. The means of 164.5 on pre-test and 163.9 on post-test support this statement.

Null Hypothesis No. 2: There is no difference in the amount of time spent transcribing from shorthand plate material on the pre-test and post-test.

Also using the data in Table I, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the time spent transcribing from plate material on the pre-test and the time spent on the post-test. The use of the Wilcoxon test resulted in a T of 2. With an N of 21 and the .05 level of significance, a tabled T of 59 or less was needed in order to reject the null hypothesis. Therefore, since the T was 2, the null hypothesis of no difference in the amount of time spent transcribing on pre-test and post-test from shorthand plate material was rejected. The alternative hypothesis that there was a difference in the amount of time spent transcribing

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[11]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences. (New York: McGraw-Hill Book Company) 1956, 312 pages.

from pre-test to post-test on plate material was accepted. The means of 16.5 on pre-test and 11.82 on post-test support this statement. Students took less time to transcribe on the post-test than on the pre-test, which indicated considerable improvement.

Table II summarizes the information from Table I in a different way and shows the transcription rate per minute on both pre-test and post-test from shorthand plate material for all 21 students.

As shown in Table II, the mean transcription rate per minute on the pre-test was 10.61; on the post-test, 14.99. The highest rate per minute on the pre-test was 13; on the post-test, 23. The lowest rate per minute on the pre-test was 7; on the post-test, 8. There was a 41 percent increase in mean transcription rate per minute from pre-test to post-test.

Null Hypothesis No. 3: There is no difference in transcription rate per minute from shorthand plate material on the pre-test and post-test.

Using the data in Table II, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the transcription rate per minute on plate material on the pre-test and that on the post-test. The use of the Wilcoxon test resulted in a T of 7.5. With an N of 20 and the .05 level of significance, a tabled T of 52 or less was needed in order to reject the null hypothesis. Therefore, since the T was 7.5, the null hypothesis of no difference in the transcription rate per minute on pre-test and pos-test from shorthand plate material was rejected. The alternative hypothesis that there was

TABLE II

TRANSCRIPTION RATES PER MINUTE OF STUDENTS ON PRE-TEST AND POST-TEST FROM PLATE MATERIAL

Student Number	Pre-Test Transcription Rate Per Minute	Post-Test Transcription Rate Per Minute
1	10	13
2	13	16
3	11	15
4	10	13
5	9	11
6	11	23
7	9	16
8	7	10
9	10	16
10	10	16
11	9	12
12	13	20
13	11	18
14	9	11
15	11	8
16	9	18
17	13	12
18	13	19
19	10	10
20	12	16
21	12	21
Mean	10.61	14.99

*T=7.5 Transcription Rate (significant at .05 level with an N of 20)

a difference in transcription rate per minute on pre-test and post-test from shorthand plate material was accepted. The means of 10.61 on pre-test and 14.99 on post-test support this statement. When rate per minute is considered, students transcribed faster on the post-test from plate material.

Influence of Increased Typing Speed.

In order to determine the possible influence of increasing typing speeds of students during the period of this study, the researcher administered a pre-test and post-test five-minute straight-copy timed writing.

Table III shows the number of words typed on both pre-test and post-test from five-minute straight-copy timed writing for all 21 students.

As shown in Table III, the mean words typed on the pre-test was 271.9; on the post-test, 299.2. The highest number of words typed on the pre-test was 345; on the post-test, 385. The lowest number of words typed on the pre-test was 180; on the post-test, 240.

Null Hypothesis No. 4: There is no difference in the number of words typed on a five-minute straight-copy timed writing on the pre-test and post-test.

Using the data in Table III on page 24, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the number of words typed on the pre-test and those typed on the post-test. The use of the Wilcoxon test resulted in a T of 13.

TABLE III

ACTUAL WORDS TYPED ON FIVE-MINUTE
STRAIGHT-COPY TIMED WRITING

Student Number	Pre-Test	Post-Test
1	270	335
2	235	285
3	295	300
4	250	240
5	250	265
6	335	320
7	345	385
8	270	280
9	340	330
10	270	285
11	180	270
12	225	250
13	300	325
14	255	270
15	210	250
16	335	350
17	235	290
18	295	320
19	225	280
20	265	300
21	325	355
Mean	271.9	299.2

*T=13 Actual Words (significant at .05 level with an N of 21)

With an N of 21 and the .05 level of significance, a tabled T of 59 or less was needed in order to reject the null hypothesis. Therefore, since the T was 13, the null hypothesis of no difference in number of words typed on pre-test and post-test timed writing was rejected. The alternative hypothesis that there was a difference in number of words typed from pre-test to post-test on the timed writing was accepted. The means of 271.9 on pre-test and 299.2 on post-test support this statement. Students did improve in their rate of typing during the quarter.

Table IV summarizes the information from Table III and shows the typing rate per minute on both pre-test and post-test from timed writing for all 21 students. As shown in Table IV, the mean typing rate per minute on the pre-test was 54.4; on the post-test, 59.8. The highest rate per minute on the pre-test was 69; on the post-test, 77. The lowest rate per minute on the pre-test was 36; on the post-test, 48. There was a 9.9 percent increase in mean typing rate per minute from pre-test to post-test.

Null Hypothesis No. 5: There is no difference in the typing rate per minute on a five-minute straight-copy timed writing on pre-test and post-test.

Using the data in Table IV, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the typing rate per minute on plate material on the pre-test and that on the post-test. The use of the Wilcoxon test resulted in a T of 13. With an N of 21 and the .05 level of significance, a tabled T of 59 or less

TABLE IV

TYPING RATES PER MINUTE ON STRAIGHT-COPY
FIVE-MINUTE TIMED WRITING

Student Number	Pre-Test	Post-Test
1	54	67
2	47	57
3	59	60
4	50	48
5	50	53
6	67	64
7	69	77
8	54	56
9	68	66
10	54	57
11	36	54
12	45	50
13	60	65
14	51	54
15	42	50
16	67	70
17	47	58
18	59	64
19	45	56
20	53	60
21	65	71
Mean	54.4	59.8

*T=13 Typing Rate (significant at .05 level with an N of 21)

was needed in order to reject the null hypothesis. Therefore, since the T was 13, the null hypothesis of no difference in typing rate per minute on pre-test and post-test on timed writing was rejected. The alternative hypothesis that there was a difference in typing rate per minute on pre-test and post-test on timed writing was accepted. The means of 54.4 on pre-test and 59.8 on post-test support this statement.

Summary Comments--Shorthand Plate Material/Typing.

The data from Table I on page 19 indicates that although the students were able to transcribe approximately the same number of correct words from pre-test to post-test on plate material, the amount of time spent transcribing the plate material on the pre-test decreased significantly on the post-test.

There was no significant difference in the number of words correctly transcribed from plate material, but there was a significant difference in the amount of time spent transcribing from plate material. This could indicate faster recognition of symbols which could be because of the pacing with shorthand slides.

Transcription rates of students from dictation.

In order to determine the changes in student achievement, a pre-test and post-test were administered in which material was dictated for three minutes at each of the speeds of 60, 70 and 80 words a minute (wam). Students were allowed 12 minutes to transcribe from their notes taken from dictation. The same dictation material was used during the pre-test and post-test. This material is shown in Appendix A.

Table V shows the words transcribed and the transcription time on the 60 wam pre-test and post-test for all 21 students. As shown in Table V, the mean words transcribed on the 60 wam pre-test was 157.0; on the post-test, 164.3. The highest number of words transcribed on the pre-test was 180; on the post-test, 180. The lowest number of words transcribed on the pre-test was 82; on the post-test, 52. The mean transcription time on the pre-test was 8.3; on the post-test, 8.5. The highest transcription time on the pre-test was 12; on the post-test, 12. The lowest transcription time on the pre-test was 5.5; on the post-test, 5.

Null Hypothesis No. 6: There is no difference in the number of words transcribed from 60 wam dictation on pre-test and post-test.

Using the data in Table V, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the number of words transcribed on the pre-test and those transcribed on the post-test. The use of the Wilcoxon test resulted in a T of 22. With an N of 19 and the .05 level of significance, a tabled T of 46 or less was needed in order to reject the null hypothesis. Therefore, since the T was 22, the null hypothesis of no difference in number of correct words transcribed on pre-test and post-test from 60 wam dictation was rejected. The alternative hypothesis that there was a difference in the number of words correctly transcribed on pre-test and post-test from 60 wam dictation was accepted. The means of 157.0 on pre-test and 164.3 on post-test support this statement. Students improved in the amount of words they could correctly transcribe.

TABLE V

WORDS TRANSCRIBED AND TRANSCRIPTION TIMES ON PRE-TEST AND POST-TEST ON 60 WAM DICTATION

Student Number	Pre-Test Correct Words	Pre-Test Transcription Time (In Min.)	Post-Test Correct Words	Post-Test Transcription Time (In Min.)
1	169	17.0	167	13.25
2	171	13.5	167	10.50
3	164	16.0	165	11.75
4	169	17.5	168	13.25
5	163	18.5	165	15.50
6	171	16.0	171	7.50
7	162	18.5	168	11.00
8	135	20.0	158	17.00
9	162	18.0	166	10.50
10	167	16.5	166	11.00
11	165	18.5	164	13.75
12	170	13.5	171	8.50
13	167	15.5	171	9.75
14	162	18.0	159	14.00
15	166	15.0	128	11.75
16	152	20.0	161	9.75
17	171	13.5	169	14.00
18	168	13.5	170	9.00
19	161	18.0	156	17.75
20	169	14.5	162	10.50
21	170	14.0	170	8.25
Mean	164.5	16.5	163.9	11.82

*T=95.0 Correct Words (not significant at .05 level with an N of 19)

*T=2.0 Transcription Time (significant at .05 level with an N of 21)

Null Hypothesis No. 7: There is no difference in the amount of time spent transcribing from the 60 wam dictation on the pre-test and post-test.

Also using the data from Table V, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the time spent transcribing from the 60 wam dictation on the pre-test and that spent on the post-test. The use of the Wilcoxon test resulted in a T of 83.5. With an N of 19 and the .05 level of significance, a tabled T of 46 or less was needed in order to reject the null hypothesis. Therefore, since the T was 83.5, the null hypothesis of no difference in amount of time spent transcribing on pre-test and post-test from 60 wam dictation was accepted. This indicated that the students did not have a major increase or decrease in the amount of time spent transcribing from the 60 wam dictation from pre-test to post-test. The means of 8.3 on pre-test and 8.5 on post-test support these statements.

Table VI summarizes the information from Table V and shows the transcription rate per minute on both pre-test and post-test from 60 wam dictation for all 21 students.

As shown in Table VI, the mean transcription rate per minute on the pre-test was 20.5; on the post-test, 20.8. The highest rate per minute on the pre-test was 32; on the post-test, 36. The lowest rate per minute on the pre-test was 11; on the post-test, 9. There was a 2 percent increase in mean transcription rate per minute from pre-test to post-test.

TABLE VI

TRANSCRIPTION RATES PER MINUTE OF STUDENTS ON PRE-TEST AND POST-TEST FROM 60 WAM DICTATION

Student Number	Pre-Test Transcription Rate Per Minute	Post-Test Transcription Rate Per Minute
1	22	35
2	11	9
3	22	20
4	13	17
5	11	15
6	17	24
7	32	36
8	17	16
9	27	25
10	28	24
11	11	10
12	22	26
13	26	22
14	13	15
15	18	10
16	19	22
17	23	22
18	23	26
19	19	15
20	25	18
21	31	30
Mean	20.5	20.8

*T=121 Transcription Rate (not significant at .05 level with an N of 21)

Null Hypothesis No. 8: There is no difference in the transcription rate per minute on the 60 wam dictation on the pre-test and post-test.

Using the data in Table VI, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the transcription rate per minute on the 60 wam dictation material on the pre-test and that on the post-test. The use of the Wilcoxon test resulted in a T of 121. With an N of 21 and the .05 level of significance, a tabled T of 59 or less was needed in order to reject the null hypothesis. Therefore, since the T was 121, the null hypothesis of no difference in the transcription rate per minute on the pre-test and post-test from 60 wam dictation was accepted. This indicated that the students did not have a major increase or decrease in transcription rate per minute on the 60 wam dictation from pre-test to post-test. The means of 20.5 on pre-test and 20.8 on post-test support these statements. However, the 9.9 percent increase in mean typing rate per minute from pre-test to post-test on five-minute straight-copy timed writing could have had an influence on the difference in transcription rate at 60 wam.

Table VII shows the percentage of the transcript completed by all 21 students on both pre-test and post-test of 60 wam dictation. The percentages were found by dividing the number of words transcribed by the total possible words (180 in the case of the 60 wam). Of the 21 students, 6 completed 95 percent or more of the 60 wam pre-test transcript; 16 students completed 95 percent or more of the 60 wam

TABLE VII

PERCENTAGE COMPLETION OF TRANSCRIPTS
ON 60 WAM DICTATION

Student Number	Pre-Test Percentage	Post-Test Percentage
1	86	98
2	46	52
3	93	98
4	82	94
5	72	98
6	93	99
7	97	100
8	90	99
9	97	98
10	100	100
11	61	69
12	97	99
13	94	99
14	86	97
15	76	29
16	91	97
17	89	99
18	100	100
19	91	100
20	92	92
21	100	98

post-test transcript. The attainment of 95 percent transcript accuracy by 10 additional students indicated improvement during the quarter. Sixteen students improved in the percentage completion from pre-test to post-test at 60 wam.

Table VIII shows the words transcribed and the transcription times on the 70 wam dictated pre-test and post-test for all 21 students. As shown in Table VIII, the mean words transcribed on the pre-test was 165.1; on the post-test, 176.9. The highest number of words transcribed on the pre-test was 222; on the post-test, 222. The lowest number of words transcribed on the pre-test was 42; on the post-test, 57. The mean transcription time on the pre-test was 10.8; on the post-test, 10.4. The highest transcription time on the pre-test was 12; on the post-test, 12. The lowest transcription time on the pre-test was 8; on the post-test, 6.75.

Null Hypothesis No. 9: There is no difference in the number of words transcribed from 70 wam dictation on pre-test and post-test.

Using the data in Table VIII, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the words transcribed on the pre-test and those on the post-test. The use of the Wilcoxon test resulted in a T of 0. With an N of 20 and the .05 level of significance, a tabled T of 52 or less was needed in order to reject the null hypothesis. Therefore, since the T was 0, the null hypothesis of no difference in the number of words transcribed on pre-test and post-test from 70 wam dictation was rejected. The alternative

TABLE VIII

WORDS TRANSCRIBED AND TRANSCRIPTION TIMES ON PRE-TEST AND POST-TEST ON 70 WAM DICTATION

Student Number	Pre-Test		Post-Test	
	Correct Words	Transcription Time (In Min.)	Correct Words	Transcription Time (In Min.)
1	200	10.5	213	9.75
2	42	11.0	57	9.25
3	193	11.0	208	11.00
4	161	12.0	171	12.00
5	80	11	107	12.00
6	195	10.0	205	9.50
7	140	11.0	159	12.00
8	212	10.5	220	10.50
9	209	12.0	218	11.00
10	222	11.0	222	10.00
11	70	11.0	119	10.50
12	214	10.5	219	11.00
13	214	10.0	220	8.25
14	118	12.0	134	12.00
15	56	8.0	67	6.75
16	207	11.0	211	10.00
17	174	12.0	180	11.00
18	220	11.0	221	10.5
19	142	12.0	160	12.00
20	185	10.0	187	10.00
21	214	9.5	217	8.50
Mean	165.1	10.7	176.9	10.3

*T=0 Correct Words (significant at .05 level with an N of 20)

*T=20.5 Transcription Time (significant at .05 level with an N of 15)

hypothesis that there was a difference in the number of words transcribed on pre-test and post-test from 70 wam dictation was accepted. The means of 165.1 on pre-test and 176.9 on post-test support this statement.

Null Hypothesis No. 10: There is no difference in the time spent transcribing from the 70 wam dictation on the pre-test and post-test.

Also using the data in Table VIII, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the time spent transcribing from the 70 wam dictation on the pre-test and that spent on the post-test. The use of the Wilcoxon test resulted in a T of 20.5. With an N of 15 and the .05 level of significance, a tabled T of 25 or less was needed in order to reject the null hypothesis. Therefore, since the T was 20.5, the null hypothesis of no difference in amount of time spent transcribing on pre-test and post-test from 70 wam dictation was rejected. The alternative hypothesis that there was a difference in the amount of time spent transcribing on pre-test and post-test from 70 wam dictation was accepted. The means of 10.8 on pre-test and 10.4 on post-test support this statement.

Table IX summarizes the information from Table VIII and shows the transcription rate per minute on both pre-test and post-test from 70 wam dictation for all 21 students. As shown in Table IX, the mean transcription rate per minute on the pre-test was 15.3; on the post-test, 17.3. The highest rate per minute on the pre-test

TABLE IX

TRANSCRIPTION RATES PER MINUTE OF STUDENTS ON PRE-TEST AND POST-TEST FROM 70 WAM DICTATION

Student Number	Pre-Test Transcription Rate Per Minute	Post-Test Transcription Rate Per Minute
1	19	22
2	4	6
3	18	19
4	13	14
5	7	9
6	20	22
7	13	13
8	20	21
9	17	20
10	20	22
11	6	11
12	20	20
13	21	27
14	10	11
15	7	10
16	19	21
17	15	16
19	12	13
20	19	19
21	23	26
Mean	15.3	17.3

*T=0 Transcription Rate (significant at .05 level with an N of 18)

was 23; on the post-test, 27. The lowest rate per minute on the pre-test was 4; on the post-test, 6. There was a 13 percent increase in mean transcription rate per minute from pre-test to post-test.

Null Hypothesis No. 11: There is no difference in the transcription rate per minute on the 70 wam dictation on the pre-test and post-test.

Using the data in Table IX, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the transcription rate per minute on the 70 wam dictation material on the pre-test and that on the post-test. The use of the Wilcoxon test resulted in a T of 0. With an N of 18 and the .05 level of significance, a tabled T of 40 or less was needed in order to reject the null hypothesis. Therefore, since the T was 0, the null hypothesis of no difference in the transcription rate per minute on pre-test and post-test from 70 wam dictation was rejected. The alternative hypothesis that there was a difference in transcription rate per minute on pre-test and post-test from 70 wam dictation was accepted. The means of 15.3 on pre-test and 17.3 on post-test support this statement. However, the 9.9 percent increase in mean typing rate per minute from pre-test to post-test on five-minute straight-copy timed writing could have had an influence on the difference in the transcription rate at 70 wam.

Table X shows the percentage of the transcript completed by all 21 students on both pre-test and post-test of 70 wam dictation. The percentages were found by dividing the number of words transcribed

TABLE X

PERCENTAGE COMPLETION OF TRANSCRIPTS
ON 70 WAM DICTATION

Student Number	Pre-Test Percentage	Post-Test Percentage
1	90	96
2	19	26
3	87	94
4	73	77
5	36	48
6	88	92
7	63	72
8	95	99
9	94	98
10	100	100
11	32	54
12	96	99
13	96	99
14	53	60
15	25	30
16	93	95
17	78	81
18	99	100
19	64	72
20	64	72
21	96	98

by total possible words (222 in the case of the 70 wam). Of the 21 students, 6 students completed 95 percent or more of the 70 wam pre-test transcript; 9 students completed 95 percent or more of the 70 wam post-test transcript. Twenty students improved in their percentage completion from pre-test to post-test at 70 wam.

Because of the inability of some students to transcribe any of the 80 wam dictation (speed was beyond their writing ability), the scores of those students transcribing nothing on either pre-test or post-test were omitted from this section of the analysis. Therefore, 16 students were included for this analysis.

Table XI shows the words transcribed and the transcription times on the 80 wam pre-test and post-test for all 16 students.

As shown in Table XI, the mean words transcribed on the pre-test was 88.9; on the post-test, 117.8. The highest number of words transcribed on the pre-test was 188; on the post-test, 208. The lowest number of words transcribed on the pre-test was 20; on the post-test, 30. The mean transcription time on the pre-test was 7.7; on the post-test, 8.1. The highest transcription time on the pre-test was 11.5; on the post-test, 11. The lowest transcription time on the pre-test was 4; on the post-test, 5.

Null Hypothesis No. 12: There is no difference in the number of words transcribed from 80 wam dictation on pre-test and post-test.

Using the data in Table XI, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the words

TABLE XI

WORDS TRANSCRIBED AND TRANSCRIPTION TIMES ON PRE-TEST AND POST-TEST ON 80 WAM DICTATION

Student Number	Pre-Test		Post-Test	
	Correct Words	Transcription Time (In Min.)	Correct Words	Transcription Time (In Min.)
1	74	6.0	118	5.75
2	82	7.0	126	8.00
3	141	11.0	173	10.25
4	20	6.0	52	6.50
5	28	4.0	60	5.5
6	138	10.0	165	8.75
7	67	10.0	110	9.25
8	80	5.5	103	5.75
9	89	6.5	99	5.50
10	51	7.75	67	7.50
11	63	7.0	80	6.75
12	137	10.00	171	10.50
13	149	7.75	159	7.00
14	37	5.00	54	6.00
15	79	8.00	110	7.00
16	188	11.50	208	11.00
Mean	88.9	7.7	117.8	8.1

*T=0 Correct Words (significant at .05 level with an N of 16)

*T=55.5 Transcription Time (not significant at .05 level with an N of 16)

transcribed on the pre-test and those transcribed on the post-test. The use of the Wilcoxon test resulted in a T of 0. With an N of 16 and the .05 level of significance, a tabled T of 30 or less was needed in order to reject the null hypothesis. Therefore, since the T was 0, the null hypothesis of no difference in number of words transcribed on pre-test and post-test from 80 wam dictation was rejected. The alternative hypothesis that there was a difference in the number of words transcribed on pre-test and post-test from 80 wam dictation was accepted. The means of 88.9 on pre-test and 117.8 on post-test support this statement.

Null Hypothesis No. 13: There is no difference in the amount of time spent transcribing from the 80 wam dictation on the pre-test and post-test.

Also using the data in Table XI, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the time spent transcribing from the 80 wam dictation on the pre-test and that spent on the post-test. The use of the Wilcoxon test resulted in a T of 55.5. With an N of 16 and the .05 level of significance, a tabled T of 30 or less was needed in order to reject the null hypothesis. Therefore, since the T was 55.5, the null hypothesis of no difference in the amount of time spent transcribing on pre-test and post-test from 80 wam dictation was accepted. This indicated that the students did not have a major increase or decrease in the amount of time spent transcribing on 80 wam dictation from pre-test to post-test. The means of 7.7 on pre-test and 8.1 on post-test support these statements.

Table XII summarizes the information from Table XI and shows the transcription rate per minute on both pre-test and post-test from 80 wam dictation for all 16 students.

As shown in Table XII, the mean transcription rate per minute on the pre-test was 11.2; on the post-test, 15.25. The highest rate per minute on the pre-test was 19; on the post-test, 23. The lowest rate per minute on the pre-test was 3; on the post-test, 8. There was a 37 percent increase in mean transcription rate per minute from pre-test to post-test.

Null Hypothesis No. 14: There is no difference in the transcription rate per minute on the 80 wam dictation on the pre-test and post-test.

Using the data in Table XII, the researcher utilized the Wilcoxon test to calculate the significance of the difference between the transcription rate per minute on the 80 wam dictation material on the pre-test and that on the post-test. The use of the Wilcoxon test resulted in a T of 0. With an N of 16 and the .05 level of significance, a tabled T of 30 or less was needed in order to reject the null hypothesis. Therefore, since the T was 0, the null hypothesis of no difference in transcription rate per minute on pre-test and post-test from 80 wam dictation was rejected. The alternative hypothesis that there was a difference in the transcription rate per minute on pre-test and post-test from 80 wam dictation was accepted. The means of 11.2 on pre-test and 15.25 on post-test support this statement. However, the 9.9 percent in mean typing rate per minute from pre-test to post-test on five-minute straight-copy timed writing could have had an influence on the difference in transcription rate at 80 wam.

TABLE XII

TRANSCRIPTION RATES PER MINUTE OF STUDENTS ON PRE-TEST AND POST-TEST FROM 80 WAM DICTATION

Student Number	Pre-Test Transcription Rate Per Minute	Post-Test Transcription Rate Per Minute
1	12	21
2	12	16
3	13	17
4	3	8
5	7	11
6	14	19
7	7	12
8	15	18
9	14	18
10	7	9
11	9	12
12	14	16
13	19	23
14	7	9
15	10	16
16	16	19
Mean	11.2	15.25

*T=0 Transcription Rate (significant at .05 level with an N of 16)

Table XIII shows the percentage of the transcript completed by all 16 students on both pre-test and post-test of 80 wam dictation. The percentages were found by dividing the number of words transcribed by the total possible words (240 in the case of the 80 wam). None of the students completed 95 percent or more of the 80 wam pre-test transcript. All 16 capable of writing at this speed level did improve in percentage completion from pre-test to post-test, but the highest percentage completed on the post-test transcript was 85 percent.

Performance of Students of Differing Ability.

In order to compare the performance of the students, the researcher obtained the ACT English scores for the students participating in the study. Three of the 21 students did not have an ACT English score; therefore, those three students were excluded from this section of the analysis.

Table XIV shows the ACT English scores for the 18 students used in this part of the analysis. Using the data in Table III on page 24 and Table XIV, the researcher utilized the Spearman rho rank difference correlation[12] (as shown in Table A-2 in Appendix C) to calculate the correlation between the student rank on the ACT English test and the student rank on the pre-test straight-copy timed writing. The use of the Spearman rho rank difference correlation resulted in an r of .243. Therefore, the r of .243 indicated a low correlation

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[12]Lee J. Cronbach, Essentials of Psychological Testing, Third Edition. (New York: Harper & Row) 1970, 752 pages.

TABLE XIII

PERCENTAGE COMPLETION OF TRANSCRIPTS
ON 80 WAM DICTATION

Student Number	Pre-Test Percentage	Post-Test Percentage
1	31	49
2	34	53
3	59	72
4	8	22
5	12	25
6	58	69
7	28	46
8	33	43
9	37	41
10	21	28
11	26	33
12	57	71
13	62	66
14	15	23
15	33	46
16	78	87

TABLE XIV

ACT ENGLISH SCORES

Student Number	ACT English Score
1	30
2	17
3	13
4	17
5	25
6	22
7	21
8	18
9	20
10	17
11	21
12	20
13	16
14	14
15	22
16	21
17	19
18	21

between student rank on ACT English scores and rank on pre-test timed writing.[13]

Using the data in Table III on page 24 and Table XIV, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on the ACT English scores and the student rank on the post-test straight-copy timed writing. The use of the Spearman rho rank difference correlation resulted in an r of .419. The r of .419 indicated a moderate correlation between student rank on ACT English and rank on post-test timed writing.

Table XV shows the gain made (positive or negative) between pre-test and post-test transcribed words and gain (positive and negative) in transcription time from shorthand plate material for all 18 students. Using the data in Table I on page 19 and Table XV, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between the student rank on ACT English scores and student rank on the gain in transcribed words on shorthand plate material. The use of the Spearman rho rank difference correlation resulted in an r of .281. The r of .281 indicated a low correlation between student rank on ACT English and rank on gain in transcribed words from shorthand plate material.

Also using the data in Table I on page 19 and Table XV, the researcher utilized the Spearman rho rank difference correlation

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[13]J.P. Guilford, Fundamental Statistics in Psychology and Education. (New York: McGraw-Hill Book Company, 1965), p.145.

TABLE XV

GAINS IN TRANSCRIBED WORDS AND TRANSCRIPTION TIMES FROM PRE-TEST TO POST-TEST ON SHORTHAND PLATE MATERIAL

Student Number	Transcribed Words Gain	Transcription Time Gain*
1	-2	-3.75
2	-4	-3.00
3	+1	-4.25
4	-1	-4.25
5	+2	-3.00
6	0	-8.50
7	+6	-7.50
8	+23	-3.00
9	+4	0.75
10	-1	-5.50
11	+1	-5.00
12	+4	-5.75
13	-3	-4.00
14	-38	-3.25
15	-2	+ .50
16	+2	-4.50
17	-5	- .25
18	0	-5.75

*Gains should be negative to express a "better transcription time.

to calculate the correlation between student rank on ACT English scores and student rank on the gain in transcription time on shorthand plate material. The use of the Spearman rho rank difference correlation resulted in an r of .126. The r of .126 indicated a slight correlation between student rank on ACT English scores and rank on gain in transcription time on shorthand plate material.

Table XVI shows the gain made (positive or negative) between pre-test and post-test transcribed words and gain (positive or negative) in transcription time from 60 wam dictation for all 18 students. Using the data in Table XIV and Table XVI, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on ACT English scores and student rank on the gain in transcribed words on 60 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of .222. The r of .222 indicated a low correlation between student rank on ACT English and rank on gain in transcribed words on 60 wam dictation.

Also using the data in Table XIV and Table XVI, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on ACT English scores and student rank on the gain in transcription time on 60 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of .401. The r of .401 indicated a moderate correlation between student rank on ACT English and rank on gain in transcription time on 60 wam dictation.

TABLE XVI

GAINS IN TRANSCRIBED WORDS AND TRANSCRIPTION TIMES FROM PRE-TEST TO POST-TEST ON 60 WAM DICTATION

Student Number	Transcribed Words Gain	Transcription Time Gain*
1	+23	-2.00
2	+12	+2.25
3	+ 9	+1.50
4	+22	-1.25
5	+47	0
6	+11	-2.25
7	+ 6	- .50
8	+17	+2.00
9	+ 2	+ .50
10	0	+1.00
11	+ 4	-1.00
12	+ 8	+1.50
13	+20	0
14	-85	-2.75
15	+17	-1.50
16	0	- .75
17	+17	+2.25
18	- 3	+ .25

*Gains should be negative to express a "better" transcription time.

Table XVII shows the gain made (positive or negative) between pre-test and post-test transcribed words and gain (positive or negative) in transcription time from 70 wam dictation for all 18 students. Using the data in Table XIV and Table XVII, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on ACT English scores and student rank on gain in transcribed words on 70 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of -.071. The r of -.071 indicated slight negative correlation between student rank on ACT English scores and student rank on gain in transcribed words on 70 wam dictation.

Also using the data in Table XIV and Table XVII, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on ACT English scores and student rank on the gain in transcription time on 70 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of -.13. The r of -.13 indicated slight negative correlation between student rank on ACT English and student rank on gain in transcription time on 70 wam dictation.

Table XVIII shows the gain made (positive or negative) between pre-test and post-test transcribed words and gain (positive or negative) in transcription time from 80 wam dictation for 13 students. Due to the inability of 5 students to write shorthand at 80 wam, their scores were deleted from this section of the analysis.

TABLE XVII

GAINS IN TRANSCRIBED WORDS AND TRANSCRIPTION TIMES FROM PRE-TEST TO POST-TEST ON 70 WAM DICTATION

Student Number	Transcribed Words Gain	Transcription Time Gain*
1	+13	- .75
2	+15	-1.75
3	+15	0
4	+10	0
5	+27	+1.00
6	+10	- .50
7	+19	+1.00
8	+ 8	0
9	+ 9	-1.00
10	0	-1.00
11	+ 5	+ .50
12	+ 6	-1.75
13	+16	0
14	+11	-1.25
15	+ 6	-1.00
16	+ 1	- .50
17	+18	0
18	+ 3	-1.00

*Gains should be negative to express a "better" transcription time.

TABLE XVIII

GAINS IN TRANSCRIBED WORDS AND TRANSCRIPTION TIMES FROM PRE-TEST TO POST-TEST ON 80 WAM DICTATION

Student Number	Transcribed Words Gain	Transcription Time Gain*
1	+44	- .25
2	+44	+1.00
3	+32	- .75
4	+32	+ .50
5	+32	+1.50
6	+27	-1.25
7	+23	+ .25
8	+10	-1.00
9	+16	- .25
10	+34	+ .50
11	+10	- .75
12	+17	+1.00
13	+20	- .50

*Gains should be negative to express a "better" transcription time.

Using the data in Table XIV on page 47 and Table XVIII, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on the ACT English scores and student rank on the gain in transcribed words on 80 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of .26. The r of .26 indicated a low correlation between student rank on ACT English and rank on gain in transcribed words on 80 wam dictation.

Also using the data in Table XIV on page 47 and Table XVIII, the researcher utilized the Spearman rho rank difference correlation to calculate the correlation between student rank on the ACT English scores and student rank on the gain in transcription time on 80 wam dictation. The use of the Spearman rho rank difference correlation resulted in an r of .146. The r of .146 indicated a slight correlation between student rank on ACT English and student rank on gain in transcription time on 80 wam dictation.

The results of all Spearman rho rank difference correlation calculations comparing student rank on ACT English scores with student achievement ranks on the tests in this study showed that there was slight correlation between the two. A higher rank on ACT English scores did not necessarily indicate a higher rank on gain made from pre-test to post-test on any of the test measures.

Students' Reactions to Use of Shorthand Slides.

As a part of the study, a student opinion sheet similar to the one used by McGuire was administered to the students to get the students' reactions to the use of slides in the teaching of transcription.

Of the 15 statements, 14 required the student to rate various activities on a five-point scale. A sample opinion sheet is shown in Appendix B. The fifteenth statement gave students an opportunity to express their feeling about the actual use of slides in the classroom. The responses to the 15th statement are also included in Appendix B.

For analysis purposes, almost always, most of the time, and about half of the time were considered positive answers, while seldom and almost never were referred to as negative answers.

Motivation to increase transcription speed. Of the 22 students in the study, 18 or 81.82 percent, responded positively that transcribing from the slides motivated them to increase their transcription speed (14 or 63.64 percent indicated either almost always or most of the time); 4 or 18.18 percent of the students responded negatively that transcribing from the slides seldom or almost never motivated them to increase their speed of transcription.

Motivation to decrease transcription errors. Of the 22 students, 13 or 59.09 percent responded positively to the statement that transcribing from the shorthand slides motivated them to decrease their transcription errors (11 or 50 percent answered almost always or most of the time), while 9 or 40.91 percent responded negatively.

Reading from slides as an aid to reading one's own shorthand notes more rapidly. Of the group of 22 students, 18 or 81.82 percent, felt that slides did help them read their own shorthand notes more rapidly. Only 4 or 18.18 percent responded negatively to this statement.

Transcribing from slides as an aid to transcribing from one's own notes. Of the 22 students questioned, 19 or 86.36 percent responded positively that it did aid in their own transcription, while only 3 or 13.63 responded negatively.

Liking the opportunity to pace transcription with slides. Of the 22 students, 21 or 95.46 percent, liked the opportunity to pace transcription with slides. Only 1 or 4.54 percent responded negatively to the use of slides.

Reading and transcribing from slides as an effective method of reviewing recently learned theory. Of the total 22 students, 21 or 95.45 percent responded positively and only 1 or 4.54 percent responded negatively to the statement that slides were effective for reviewing recently learned theory. Of those responding positively, 13 or 59.09 percent gave the extreme opinion that the slides were almost always effective in reviewing recently learned theory; while of those responding negatively, no student responded that the slides were almost never effective in reviewing recently learned theory.

Inability to recognize shorthand outlines hindering the development of transcription speed. Of the 22 students, 14 or 63.63 percent, felt that their inability to recognize shorthand outlines on the slides did not hinder the development of transcription speed by responding

seldom or almost never to the statement. Of the group, 8 or 36.37 percent responded positively that the inability to recognize outlines did hinder the development of transcription speed.

Typewriting speed hindering the development of transcription speed. Of the 22 students, 16 or 72.73 made negative responses that typing speed seldom or almost never hindered the development of transcription speed. The extreme negative response of almost never was given by 50 percent of the students. Only 6 or 27.27 percent responded positively that typing speed did hinder their transcription speed development. Of those responding positively, 2 chose the extreme response of almost always, no student responded most of the time, and 4 responded half of the time.

Typographical errors hindering the development of transcription speed. Of the group of 22, 13 or 59.09 responded negatively that typographical errors did not hinder the development of transcription speed, while 9 or 40.92 percent responded positively that typographical errors did hinder the development of transcription speed.

Rate of slide projection. In response to the statement, "I was bothered by having to wait for the next slide to appear on the screen," 19 or 86.37 percent responded negatively that they were seldom or almost never bothered by having to wait for the next slide. Two students responded that they were bothered by waiting half of the time, no student responded that she was bothered by waiting most of the time while 1 or 4.54 percent of the students responded that they were bothered by waiting almost always.

Length of slide sessions. No student responded that the slide sessions were almost always too long, only 2 or 9.09 percent said sessions were too long most of the time, and only 1 stated they were too long about half of the time. Of the group of 22 students, 19 or 86.37 percent stated that the sessions were seldom or almost never too long.

Frequency of slide sessions. Of the group, 20 or 90.91 percent responded that twice a week was frequent enough for slide sessions, while only 2 or 9.09 percent responded that twice a week was seldom frequent enough. No student answered that twice a week was never frequent enough.

Homework related to the material on the slides as an aid in transcribing from the slides. Of the total 22 students, 16 or 72.73 percent responded positively that the homework related to the material on the slides as an aid to transcribing from the slides, while 6 or 27.27 percent responded negatively to the statement.

Inquiring about words students did not know. When given the opportunity to ask the instructor any words they did not know, 13 or 59.09 percent of the 22 students responded that they almost always or most of the time asked about words they did not know, while 9 or 40.91 percent answered that they seldom or almost never asked about words they did not know.

Overall opinion of transcribing from slides. Positive responses were given by 77.27 percent of the students, and negative responses were made by 9.09 percent of the students. Three students did not

write any opinion. Those who gave negative responses indicated that it made them nervous to transcribe from slides and it did not help as much as small group sessions for dictation held earlier in the quarter.

Summary of Students' Opinions

In general, the students liked the slides. Comments were made indicating the students felt the slides helped in reading shorthand, increased typing speed, increased transcription speed, and motivated them to make fewer typing errors. Many felt it was a good change from regular classroom activity.

CHAPTER III

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

A summary of the study and the conclusions and recommendations are presented in this chapter.

The purpose of this study was to pilot-test a pacing technique using a set of slides for teaching transcription in a second-quarter Century 21 Shorthand class at The University of Tennessee, Knoxville, Winter Quarter, 1977. The study was conducted using 22 students in a second-quarter Century 21 shorthand class. Students were given pre-tests (to measure levels of achievement) consisting of a five-minute timed writing; a transcription from shorthand plate test; and a dictation test at 60, 70, and 80 words a minute. The researcher then used pacing slides in practice sessions for 20 minutes a day, twice a week for five weeks. At the end of this period the same pre-test was given as a post-test to the same students. The data gathered during the study were analyzed by use of the Wilcoxon test and the Spearman rho rank difference correlation.

Findings

The following are the major findings in this study:

1. Using the Wilcoxon T, there was no significant difference in the number of words correctly transcribed from shorthand plate material on the pre-test and post-test. (Class mean: pre-test, 164.5; post-test, 163.9)

2. Using Wilcoxon T, there was a significant difference in the amount of time spent transcribing from shorthand plate material on the pre-test and post-test. (Class mean: pre-test, 16.5; post-test, 11.82)

3. There was a 41 percent increase in mean transcription rate per minute from shorthand plate material from pre-test to post-test.

4. Using Wilcoxon T, there was a significant difference in transcription rate per minute from shorthand plate material on the pre-test and post-test. (Class mean: pre-test, 10.61; post-test, 14.99)

5. Using Wilcoxon T, there was a significant difference in the number of words typed on a five-minute straight-copy timed writing on the pre-test and post-test. (Class mean: pre-test, 271.9; post-test, 299.2)

6. There was a 9.9 percent increase in mean typing rate per minute from pre-test to post-test.

7. Using Wilcoxon T, there was a significant difference in the typing rate per minute on a five-minute straight-copy timed writing on pre-test and post-test. (Class mean: pre-test, 54.4; post-test, 59.8)

8. Using Wilcoxon T, there was a significant difference in the number of words transcribed from 60 wam dictation on pre-test and post-test. (Class mean: pre-test, 157.0; post-test, 164.3)

9. Using Wilcoxon T, there was no significant difference in the amount of time spent transcribing from the 60 wam dictation on the pre-test and post-test. (Class mean: pre-test, 8.3; post-test, 8.5)

10. Using Wilcoxon T, there was no significant difference in the transcription rate per minute on the 60 wam dictation on the pre-test and post-test. (Class mean: pre-test, 20.5; post-test, 20.8)

11. Using the Wilcoxon T, there was a significant difference in the number of words transcribed from 70 wam dictation on pre-test and post-test. (Class mean: pre-test, 165.1; post-test, 176.9)

12. Using the Wilcoxon T, there was a significant difference in the time spent transcribing from the 70 wam dictation on the pre-test and post-test. (Class mean: pre-test, 10.7; post-test, 10.3)

13. There was a 13 percent increase in mean transcription rate per minute from pre-test to post-test on 70 wam dictation.

14. Using Wilcoxon T, there was a significant difference in the transcription rate per minute on the 70 wam dictation on the pre-test and post-test. (Class mean: pre-test, 15.3; post-test, 17.3)

15. Using Wilcoxon T, there was a significant difference in the number of words transcribed from 80 wam dictation on pre-test and post-test. (Class mean: pre-test, 88.9; post-test, 117.8)

16. Using Wilcoxon T, there was no significant difference in the amount of time spent transcribing from the 80 wam dictation on the pre-test and post-test. (Class mean: pre-test, 7.7; post-test, 8.1)

17. There was a 37 percent increase in mean transcription rate per minute from pre-test to post-test on 80 wam dictation.

18. Using Wilcoxon T, there was a significant difference in the transcription rate per minute on the 80 wam dictation on the pre-test and post-test. (Class mean: pre-test, 11.2; post-test, 15.25)

19. For each of the following items, a slight or low correlation was obtained between student rank on ACT English scores and student rank on:

a. pre-test timed writing.

b. gain in transcribed words from shorthand plate material.

c. gain in transcription time from shorthand plate material.

d. gain in transcribed words from 60 wam dictation.

e. gain in transcribed words from 80 wam dictation.

f. gain in transcription time on 80 wam dictation.

20. For each of the following items, moderate correlation was obtained between student rank on ACT English scores and student rank on:

a. pre-test timed writing.

b. gain in transcription time from 60 wam dictation.

21. For each of the following items, slight negative correlation was obtained between student rank on ACT English scores and student rank on:

a. gain in transcribed words from 70 wam dictation.

b. gain in transcription time from 70 wam dictation.

22. Student responses to the opinion sheet indicated 81.82 percent of the students felt the slides did help them read their own shorthand notes more rapidly.

23. Student responses to the opinion sheet indicated 81.81 percent of the students felt that transcribing from the slides motivated them to increase their transcription speed.

24. Student responses to the opinion sheet indicated 95.45 percent of the students liked the opportunity to pace transcription with slides.

25. Student responses to the opinion sheet indicated 95.45 percent of the students felt that slides were effective in reviewing recently learned theory.

Conclusions

The following are the conclusions made by the researcher after completion of this study:

1. The use of the slide technique results in an improved student transcription ability when transcribing from their own notes. This conclusion is based upon the findings that students correctly transcribed more words from pre-test to post-test on the dictation tests at 60, 70, and 80 words a minute. However, the fact that student typing rates also increased based on the finding that the typing rate on the five-minute straight-copy timed writing increased from pre-test to post-test, might also have had some influence on the increase in number of words transcribed on the 60, 70, and 80 wam tests.

2. The use of the slide technique results in an improved student transcription rate when transcribing from shorthand plate material. This conclusion is based on the findings that although students transcribed about the same number of words from pre-test to post-test from plate material, the mean rate per minute of transcription increased 41 percent from pre-test to post-test. Again, typing rate increase could have a bearing here, but the mean typing rate increase from pre-test to post-test on the five-minute straight-copy timed writing was only 9.9 percent.

Recommendations

As a result of this study, the following recommendations are made:

1. Conduct an experimental study using the slide technique during the second and third-quarter Century 21 shorthand classes utilizing control and experimental groups.

2. Conduct an experimental study whereby pacing with slides is utilized with usage of correction devices. Students would be expected to correct errors while transcribing from the slides.

3. Use of the slide technique in the teaching of transcription and basic theory review from first quarter throughout instruction period.

4. Use of the slide technique in which slides are shown at ever-increasing rates to accommodate the faster students in the class.

BIBLIOGRAPHY

BIBLIOGRAPHY

Barber, Shirley. "The Effectiveness of Tachistoscopic Training in Collegiate Elementary Shorthand," (unpublished Doctoral dissertation, Colorado State College, 1961).

Cronbach, Lee J. Essentials of Psychological Testing, Third Edition. New York: Harper & Row, 1970.

Crump, Barbara R. "A Comparison Study of Classroom Practice in Shorthand and Transcription Classes in Selected Arkansas Schools, with Survey of Professional Literature and Pertinent Research from 1958-68," (unpublished Ph.D. dissertation, University of Arkansas at Fayetteville, 1970).

Gryder, Robert. "Teaching Transcription on the Secondary Level: Theories and Practices," (unpublished Ph.D. dissertation, University of North Dakota at Grand Forks, 1964).

Guilford, J.P. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill Book Company, 1965.

Jester, Donald D. "A Time Study of the Shorthand Transcription Process," (unpublished Ph.D. dissertation, North-Western University at Evanston, Illinois, 1959).

Jester, Donald D. "We Can Improve Transcription by Learning How the Transcriber's Time is Split Up," Business Education World, Vol. 42, (January 1962).

Leslie, Louis A. Methods of Teaching Transcription. New York: Gregg McGraw-Hill, 1949.

Liles, Parker. "We Should Increase Transcription Speed," Business Education World, Vol. 42, (June 1962).

McGuire, Gertrude Mynear. "Pacing Transcription with Shorthand Slides: The Effect on Speed and Accuracy," (unpublished Ph.D. dissertation at The University of Tennessee, Knoxville, 1970).

Rankin, Pearl M. "The Development of Transcribing Skill in Shorthand Instruction (1900-1960)," (unpublished Ph.D. dissertation, University of Pittsburgh, 1963).

Schlosser, Kathleen Elizabeth. "Survey of the Shorthand Transcription Courses in the High School of the United States," (unpublished master's thesis, Colorado State College at Greeley, 1933).

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, 1956.

Wanous, S.J. and Irol V. Whitmore. "Consider the Principal Factors That Affect the Development of Transcription Skill," The Balance Sheet, Vol. 23 (May 1942).

Wanous, S.J. and Irol V. Whitmore. "Transcription Teaching Aids and Devices," The Balance Sheet, Vol. 24, (September 1942).

APPENDICES

APPENDIX A

PRE-TESTS AND POST-TESTS

SAMPLE SLIDE MATERIAL

PRE-TEST AND POST-TEST STRAIGHT-COPY TIMED WRITING*

A date had been set for a conference of all the members of the organization. The chairman of the program committee was the head of our department. He came back from the planning meeting, which had been held in our building, with the news of his assignment. He said that he would need the help of his total staff if we were to do all that had to be done before August. The conference was scheduled for the second week in that month. We had no idea of what was ahead of us. We thought, though, that there could not be an unreasonable amount of work for us to do. It was not long until we began to see what would have to be done in the six months before the conference.

The secretary in our department was a highly efficient woman, whom we like very much. It was a pleasure for us to do tasks for her. All of us, the file clerks as well as the typists, were ready to rush the jobs we were doing to find time to handle special assignments Miss Brown needed done. After the head of the department announced his new responsibility, Miss Brown told us that this meant a great deal of additional work for all of us. She did not stop the explanation at that point, though. She went on to say that the purpose of the conference was a highly important one. She stated in clear terms that we would be making a valuable contribution to a very worthy activity through the work we would be doing for the conference. She then enumerated what we would need to do if we were to be of help in the months ahead.

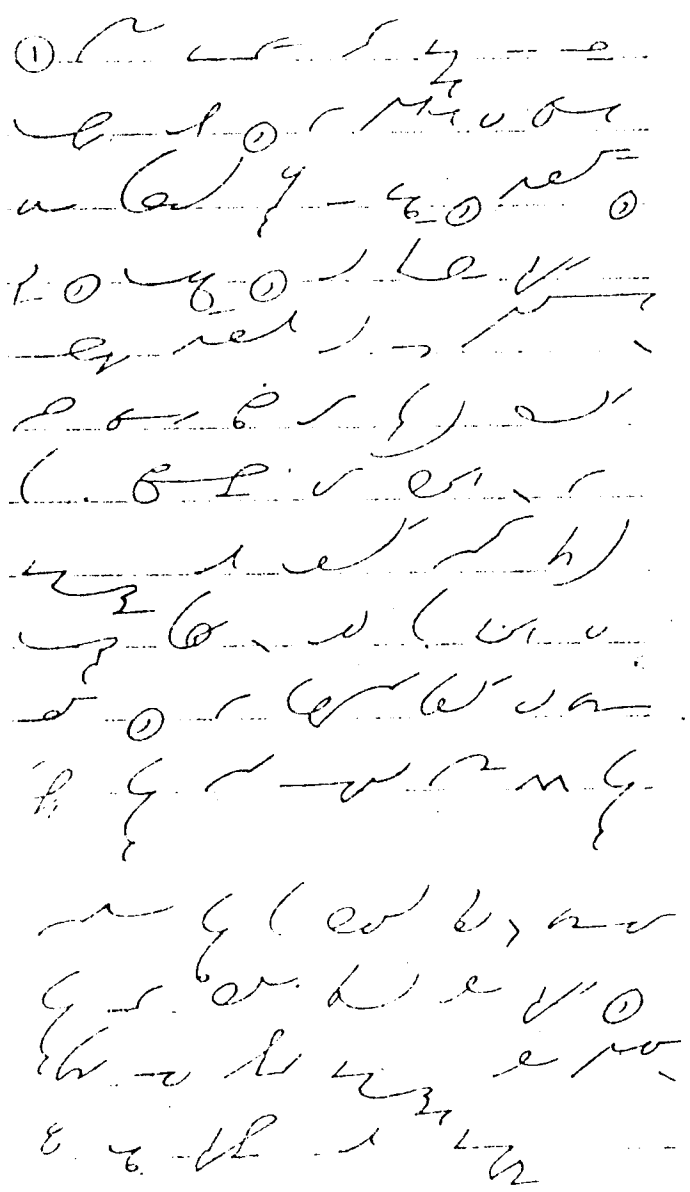
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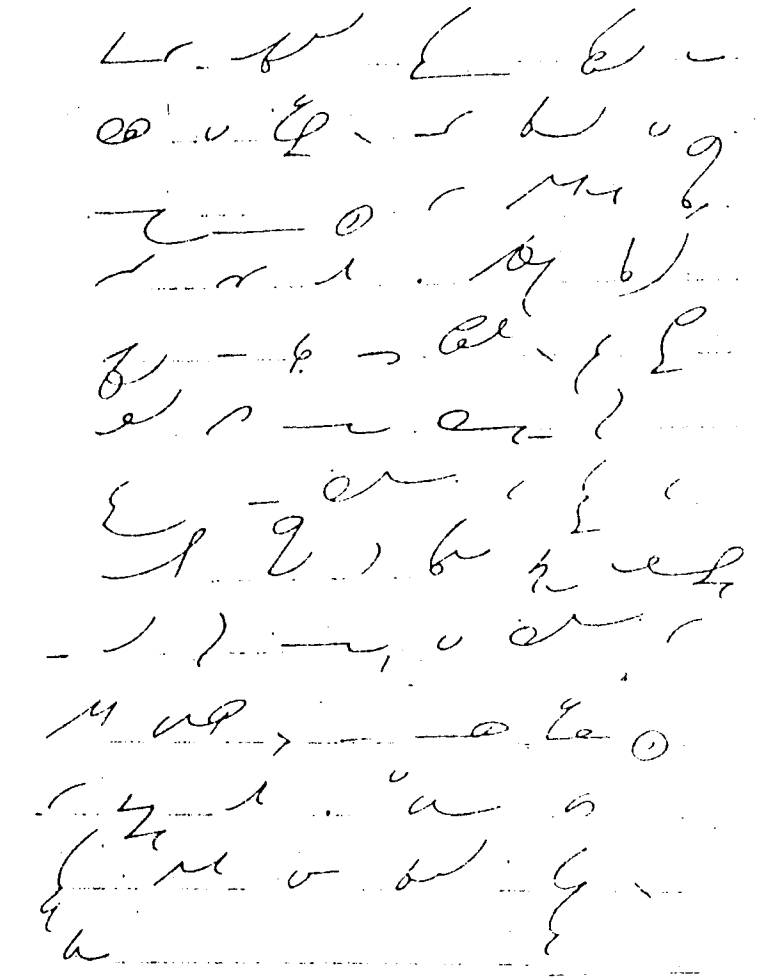
*Mary Ellen Oliverio and Harold O. Palmer, Graded Timed Writings (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1959), pp. 52-54.

First, we would need to type thousands of letters. Letters would be sent to many persons inviting them to participate in the program. Since the conference would last a week, there would be many meetings with speakers and panel members. After the complete program was determined, letters would have to be sent to the membership informing them of the plans for the week. Letters would also be sent to the newspapers and magazines in all parts of the country, giving the editors of these publications the information needed to report the conference.

Second, the girl in charge of our files would need to set up a special section to handle the new correspondence. She was able to do this with no trouble. Because Miss Brown was able to organize the work well, it was easy to do these extra tasks along with our regular ones. We became very much interested in the total plans. We looked forward to receiving the replies to the invitations. We were happy when a speaker accepted an assignment; we were sad when a speaker said he would be unable to attend the conference.

PRE-TEST AND POST-TEST SHORTHAND PLATE MATERIAL





PRE-TEST AND POST-TEST 60 WAM DICTATION MATERIAL

Dear Mr. Jones:

It is a pleasure to reserve a double room for you and your wife at the Baker Hotel for / the first week during March. If you find that you are unable to attend the convention, send a telegram so / that we may let someone else have the room. Our hotel will be filled during that week, and there will be many late re (1) quests we will be unable to honor. You are wise to request a reservation at an early date while we / still have rooms.

You will find a number of places of great interest near the hotel. A brochure about our cit/y is enclosed. In this brochure you will find many plays, movies, and special events listed for the first week of (2) March. You will also find a list of impressive stores of all types in the area.

Transportation is avail/able from our hotel to the airport, and the bus leaves the hotel at frequent intervals.

Thank you for inquir/ing about our facilities. You can look forward to a very exciting visit in Dallas.

Yours truly, (3)

PRE-TEST AND POST-TEST 70 WAM DICTATION MATERIAL

Dear Mrs. Davis:

Thank you for your letter requesting our latest price list. Our price list was mailed to you today, and you should receive it in the next day or two. Because of the important savings / and promptness with which all orders are handled, shopping from our catalogue is now the buying pattern of many of our customers. You will like ordering your supplies by mail. I want to call your (1) attention to the shipping schedule. As the size of orders is increased, shipping rates become low/er. This means added savings for you. You may be sure of your orders being handled very careful/ly. This has acquired for us many friends in the past.

You are, of course, a good shopper; and you have / often done your shopping through our catalogue. Buying from our catalogue means you know more about the merchandise you buy. You know the prices are right. You know you are getting fine merchandise. You can / put off buying until the need is great and then make a purchase at the nearest store. This plan leaves no / time to consider whether you are getting the best buy. It takes a great deal of thinking to find/ the best values, to plan ahead for your coming needs, and to do a good job of spending your money. (3) Yours truly,

PRE-TEST AND POST-TEST 80 WAM DICTATION MATERIAL

Dear Mrs. Smith:

Because you trade at our store on a regular basis, we want you to receive special service. / You are being given an opportunity for a preview of the fine furniture to be featured during / our annual sale.

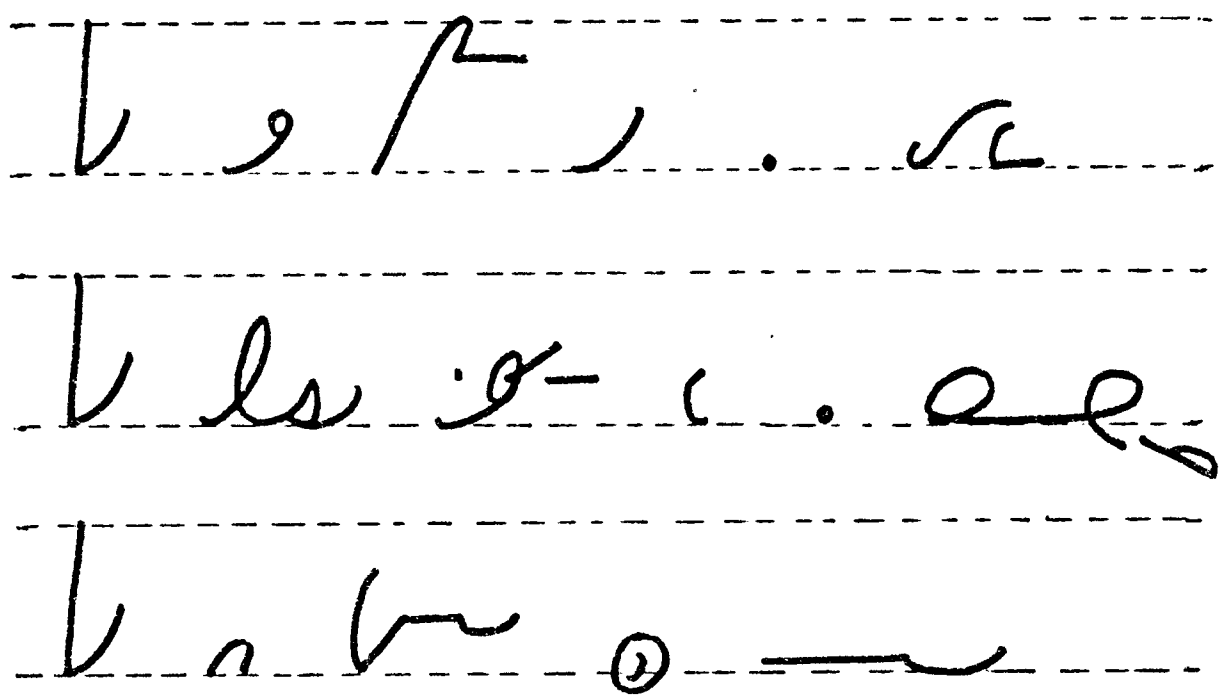
If you will simply hand the discount card to a salesman in our store, he will let you buy your / choice of furniture now at the spring sale prices. Much of this unusual merchandise will not be offered to (1) the entire public before two months. This is your big chance to select either modern or traditional furni/ture.

In addition to the many sale items, special discounts are available on any sales which total / more than $500. This discount offer is good for one week only. You may use your credit card and still / get the benefit of the discount. If you charge your purchases, you can buy now at our low sale prices and make (2) small payments after you receive your monthly checks.

When you see the fine furniture and home furnishings, you will dis/cover impressive savings. Now is the perfect time to buy that new table, chair, or lamp you have been wanting for / a long time. You will not see bargains like ours in any other store in town. You will find just the item you need / to add that extra touch to your home. Come in today and take advantage of this very fine offer.

Yours truly, (3)

SAMPLE SLIDE



APPENDIX B

STUDENT OPINION FORM AND WRITTEN RESPONSES

STUDENT OPINIONS OF TRANSCRIBING FROM SHORTHAND SLIDES

Instructions: Write the appropriate response (almost always, most of the time, about half the time, seldom, or almost never) in the column to the right of each question.

1. Transcribing from the shorthand slides motivated me to increase my transcription speed.

2. Transcribing from the shorthand slides motivated me to decrease my transcription errors.

3. Reading from the slides helped me to read my own shorthand notes more rapidly.

4. Transcribing from the slides helped me to transcribe from my own notes more rapidly.

5. I liked the opportunity to pace my transcription with the slides.

6. The slides were effective for reviewing the recently learned theory.

7. My inability to recognize the shorthand outlines on the slides hindered the development of my transcription speed.

8. My typing speed hindered the development of my transcription speed.

9. Typographical errors hindered the development of my transcription speed.

10. I was bothered by having to wait for the next slide to appear on the screen.

11. The transcription session was too long.

12. Twice a week was frequent enough for transcribing from slides.

13. The homework related to the material on the slides aided my transcribing from the slides.

14. Following the reading period, I asked the instructor any words that I did not know.

15. Write on the back of this page your overall opinion of transcribing from the slides.

RESPONSES TO OPEN-END QUESTION ON STUDENT OPINION FORM

I felt it increased my transcription speed.

I liked transcribing from the slides because I did need help transcribing my own notes. I thought it was a good idea whether I improved or not.

I think that transcribing from the slides has helped in reading the shorthand and typing speed.

I feel that it was enjoyable and helpful to recognize words.

Transcribing from the slides was beneficial to reading and transcribing my own notes. It also improved my typing because I was trying harder to make less mistakes--they take time!

Transcribing from the slides was a help to my own transcribing and it also helped when taking dictation.

I thought that the transcribing material was a good idea and does help in reading and transcribing one's own shorthand notes.

It made me nervous and that affected my typing. I felt since I wasn't a real good typist that I was probably that worst in the class.

It is very helpful to transcribe the slides.

I liked the slides pretty much, and I think they helped me a lot. Especially in reading. Mine own notes I still have to decipher. But I think seeing the slides as often as we did helped me to know how to write many words.

It was fun, it did help w/ transcription in general, but not from my notes. The slides were accurate, and I feel that they were a help to my abilities in trans.

The slides were a help to me in learning to recognise some words.

Good, helped quite a bit. Sometimes too long though.

Transcribing from the slides was helpful in increasing the speed of typing from shorthand!

The transcribing from slides was good, yet if a person doesn't know a word it messes them up and they get behind.

The slides were a change from what all we were doing and I thought they were good. It was a help.

The slides really did not help me. If they did I wasn't aware of it. There were other projects, like special group for dictation, that increased by ability.

The slides were a change & I feel they helped my reading from my own notes.

Very good idea and aided in reading actual handwritten outlines other than my own. Good opportunity to increase speed.

APPENDIX C

WILCOXON AND SPEARMAN RHO CALCULATIONS

TABLE A-1

WILCOXON TEST: CORRECT WORDS FROM PLATE MATERIAL

Student Number	Pre-Test	Post-Test	d	Rank of d	Rank with Less Frequent Sign
1	169	167	- 2	- 7.5	
2	171	167	- 4	-12.0	
3	164	165	+ 1	+ 3.0	3.0
4	169	168	- 1	- 3.0	
5	163	165	+ 2	+ 7.5	7.5
6	171	171	0		
7	162	168	+ 6	+15.0	15.0
8	135	158	+23	+18.0	18.0
9	162	166	+ 4	+12.0	12.0
10	167	166	- 1	- 3.0	
11	165	164	- 1	- 3.0	
12	170	171	+ 1	+ 3.0	3.0
13	167	171	+ 4	+12.0	12.0
14	162	159	- 3	-10.0	
15	166	128	-38	-19.0	
16	152	161	+ 9	+17.0	17.0
17	171	169	- 2	- 7.5	
18	168	170	+ 2	+ 7.5	7.5
19	161	156	- 5	-14.0	
20	169	162	- 7	-16.0	
21	170	170	0		
					____
N = 19 (due to two zeroes in d column)					T=95.0

TABLE A-2

SPEARMAN RHO RANK DIFFERENCE CORRELATION:
TIMED WRITING PRE-TEST

Student Number	English ACT	Words Typed	Ranks ACT	Ranks Typing	Rank Difference(D)	Squared Difference(D^2)
1	30	270	1.0	9.0	- 8.0	64.00
2	17	235	14.0	14.5	- .5	.25
3	13	295	18.0	6.5	+11.5	132.25
4	17	250	14.0	12.5	+ 1.5	2.25
5	25	250	2.0	12.5	-10.5	110.25
6	22	335	3.5	3.0	+ .5	.25
7	21	345	6.5	1.0	+ 5.5	30.25
8	18	270	12.0	9.0	+ 3.0	9.00
9	20	340	9.5	2.0	+ 7.5	56.25
10	17	270	14.0	9.0	+ 5.0	25.00
11	21	225	6.5	16.5	-10.0	100.00
12	20	300	9.5	5.0	+ 4.5	20.25
13	16	255	16.0	11.0	+ 5.0	25.00
14	14	210	17.0	18.0	- 1.0	1.00
15	22	235	3.5	14.5	-11.0	121.00
16	21	295	6.5	6.5	0	0
17	19	225	11.0	16.5	- 5.5	30.25
18	21	325	6.5	4.0	+ 2.5	6.25

$\Sigma D^2 = 733.50$

$$r = 1 - \frac{6(\Sigma D^2)}{N(N^2 - 1)}$$

$$r = 1 - \frac{6(733.5)}{18(324 - 1)}$$

$$r = 1 - \frac{4401}{18(323)}$$

$$r = 1 - \frac{4401}{5814}$$

$$r = 1 - .757$$

$$r = .243$$

VITA

Linda Elaine Huddleston Ousley was born on September 25, 1952, in Sparta, Tennessee. She and her brother, Charles, were the only children of Mr. W.C. Huddleston and the late Mrs. Elaine Huddleston. Her elementary and secondary education were received in Sparta, Tennessee.

She attended The University of Tennessee at Knoxville for her undergraduate education. During this time, she was employed as a part-time typist for the Psychology Department at UT for one year and as a part-time secretary in the Business Education Department for two years.

Upon receipt of her Bachelor of Science in 1974, she was employed in the Chattanooga Public Schools as a Vocational Office Education teacher and Adult Evening School instructor until June 1976.

In June 1976, she accepted a graduate teaching assistantship at The University of Tennessee at Knoxville and began work toward her Master of Science degree. She received this degree in August 1978.

From August 1977 to August 1978, she was employed as a full-time secretary and fulfilled the experience requirement for status as a Certified Professional Secretary (received in April 1978). In August 1978, she will begin an interim teaching position with Oak Ridge High School.

Her professional and honorary memberships include the National Education Association, the Tennessee Education Association, National Business Education Association, Delta Pi Epsilon, Phi Kappa Phi, and Beta Gamma Sigma.

She is married to Ralph Lea Ousley, Jr., of Knoxville, Tennessee.