

1997

A descriptive study on natural stroke tendencies in manuscript and cursive handwriting

Barbara G. Coomes
University of Dayton

Follow this and additional works at: https://ecommons.udayton.edu/graduate_theses

Recommended Citation

Coomes, Barbara G., "A descriptive study on natural stroke tendencies in manuscript and cursive handwriting" (1997). *Graduate Theses and Dissertations*. 2112.
https://ecommons.udayton.edu/graduate_theses/2112

This Thesis is brought to you for free and open access by the Theses and Dissertations at eCommons. It has been accepted for inclusion in Graduate Theses and Dissertations by an authorized administrator of eCommons. For more information, please contact mschlangen1@udayton.edu, ecommons@udayton.edu.

**A DESCRIPTIVE STUDY ON NATURAL STROKE
TENDENCIES IN MANUSCRIPT AND
CURSIVE HANDWRITING**

MASTER'S PROJECT

Submitted to the School of Education,
University of Dayton, in Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education

By

Barbara G. Coomes

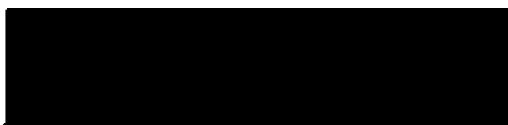
School of Education

UNIVERSITY OF DAYTON

Dayton, Ohio

April, 1997

APPROVED BY:



Official Advisor

ACKNOWLEDGEMENTS

A special thanks to my principal and the teachers involved in this study. I appreciate their support, time, and encouragement. Also, thank you to all 101 kindergarten and second grade students who participated in the study. This research would not have been possible without your cooperation.

I would also like to thank Dr. Dill for his guidance in writing this study. My thanks to Mr. Mike Rayle for his help with the statistical portion of the study.

Most of all, I am grateful to my family for their support, love, and patience.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	iii
DEDICATION.....	v
CHAPTER	
I. INTRODUCTION.....	1
II. REVIEW OF LITERATURE.....	9
III. METHODOLOGY.....	20
IV. RESULTS.....	24
V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	26
Summary.....	26
Conclusions.....	28
Recommendations.....	29
BIBLIOGRAPHY.....	30

DEDICATION

To

my mother, Charlotte,

for her love, support and encouragement,

now and always.

B.C.

CHAPTER I

INTRODUCTION

“Writing is a means of expressing one’s thoughts and communicating with others, and a fundamental part of writing is the learning and forming of letter symbols” (Hackney: Zaner-Bloser, Inc., Year unknown). “Sometime, someone decided that all writing had to imitate the printed word, and beginners were thrust into manuscript letters as the only acceptable procedure” (Getman, 1985). However, throughout time the most efficient way to achieve forming letters in this manner has been debated. There are currently four styles of manuscript on the market: cursive, italic, manuscript, and D’Nealian. Each has its own strengths and weaknesses. The major focus of these styles of writing in elementary education seems to be legibility and ease of transition to cursive.

G.N. Getman (1985) stated that writing is the most important learning process. He also said this process is unique to human behavior, and man's ability to draw and write the symbols which express his needs and ideas is the ultimate of all human performances. Even though the importance of handwriting is recognized, the emphasis on handwriting in the elementary curriculum continues to decrease. "The change in the emphasis of writing as a process rather than a product has greatly influenced the instruction of handwriting as a tool of writing" (Farris, 1991).

About the time students feel completely comfortable with printing, the transition to cursive is initiated. This usually occurs in the middle of second grade or the beginning of third grade. Some feel that this interferes with students' learning, creating tension and frustration. With the reduction of daily formal handwriting instruction, such a change becomes a long-term endeavor.

Many studies have been done on the transition from manuscript to cursive. New styles of manuscript have been developed and old styles reintroduced to help make the change easier for young students. Even with the new styles and additional information on handwriting, students still tend to struggle with the initial change.

Need Statement

Through observation and teaching of students, a natural tendency occurs with students in their early attempts to master the traditional manuscript style. Many young students tend to form letters from the bottom and stroke upward. Circles often begin on the baseline and swing up and around. Straight lines or sticks also begin at the baseline and are formed using an upward motion. An example of this was given by Steve Graham while observing his six-year-old daughter. He observed, "When forming a capital U she would start on the baseline, curve up to the left to form one-half of the U, lift her pencil from the paper, return to her starting point on the baseline, and swing up to the right to complete the other half of the U!" (Graham, 1992). This natural tendency to start at the bottom and go up is the exact opposite of the traditional manuscript style of instruction in which students are taught to start at the top and stroke down. When printing a traditional manuscript letter containing a circle, the starting point of the circle, as well as the direction, varies.

In formal instruction, circles and sticks that are made from the bottom up, regardless of how neat, are considered incorrect. Some feel this is due to the student's developmental level. "Teaching handwriting is a most complex

task. The child learns to write letters from the top of the page down and to proceed from left to right. This follows developmental laws and for right-handed people is based on natural development" (Rubin, 1985). Students must start at the top and stroke down when using the traditional manuscript writing.

In cursive handwriting students are taught to begin twenty-two out of twenty-six capital letters at the top line and stroke around and down.

However, when students are introduced to lower case cursive letters, they are taught to touch the baseline and stroke up. Twenty out of twenty-six lower case letters are formed in this manner. When connecting cursive letters, all twenty-six lower case letters are formed by stroking from the bottom up.

This is important when we consider that lower case letters are used for over 80 percent of all writing (Duvall, 1985). In formal training with manuscript, students are taught to form letters in the opposite direction consistent with their natural tendencies.

Problem Statement

There is a need for more in-depth research to study the relationship between the natural tendencies of students at forming manuscript and their transition to cursive writing. According to Schickedana (1986), "We do not know exactly how children gain complete accuracy in making letters, but it appears that at least some children do not achieve it only through practice in making letters correctly."

It seems counter-productive for children to change their natural tendencies only to have them return to them a few years later.

The purpose of this study was to observe the natural stroke tendencies students exhibit when using manuscript and cursive writing. This study investigated the following questions.

1. What are the natural stroke tendencies children exhibit when writing manuscript?
2. What are the natural stroke tendencies children exhibit when writing in cursive?
3. Is there a relationship between the natural stroke tendencies children exhibit when using manuscript and using cursive?

Limitation

One limitation of this study was that some children had prior experience with manuscript and cursive writing before formal instruction began.

Another limitation was the children's natural stroke tendency in cursive writing may be influenced by previous formal instruction of manuscript.

The time span between the testing of the first student and the last could also be a limitation. In the interim, teachers may have demonstrated or modeled correct letter formation.

The final limitation of this study was that not all letters of the alphabet were evaluated. Due to time constraints, students were not asked to replicate letters that were similar.

Definitions

Cursive Handwriting - printing in which letters are joined (Funk & Wagnals, 1963).

D'Nealian - writing system designed to help students move easily to cursive. Students can draw nearly all letters of the alphabet with a single continuous stroke (Viadero, 1993).

Formal Training - pertaining to established methods, models, or forms of practice instruction or drill, as to acquire a skill (Fun & Wagnalls, 1963).

Italic - based on a style of writing popular during the Renaissance period. They consist of slanted letters, some of which are joined while others are not (Hackney, Zaner-Bloser, Year unknown).

Manuscript - (also called printing) brought to the United States from England in the early 1920's. A writing style in which the letters are formed from simple strokes, circles and sticks (Hackney, Zaner-Bloser, Year unknown).

Natural Tendencies - belonging to or existing in one's nature; not acquired; innate. The state of being directed toward some purpose, end, or result, inclination (Funk & Wagnalls, 1963).

Traditional Manuscript - the knowledge or practices transmitted from generation to generation in which letters are formed from simple strokes, circles and sticks (Funk & Wagnalls, 1963).

Transition - the act or state of passing from one action to another; change (Funk & Wagnalls, 1963).

CHAPTER II

REVIEW OF RELATED LITERATURE

Donald Graves (1983) stated, "Handwriting is the vehicle carrying information on its way to a destination. If it is illegible the journey may not be completed. Handwriting, like skin, shows the outside of the person. But beneath the skin beats the living organism, the life's blood, the ideas, the information." As Graves stated, the information within the writing is very important; however, it appears the quality of the handwriting affects the academic outcome of assignments. Research by Reis (1989) and also Markham (1976) found that teachers were influenced by the quality of students' handwriting when evaluating papers; students with better handwriting were given higher grades than those with poor handwriting. The quality of the content of the assignment made no difference in the grading.

This leads to the question: "What is handwriting?" Getman (1985) stated, "Handwriting can best be described as the visually directed changes in direction of the movements the hand must make to form letters and words." To achieve this, the child's perceptual motor skill development is essential. "The term 'perceptual motor skills' refers to the coordination of perceptual processes (the awareness of objects or data through the senses) with motor responses. All observable responses are essentially perceptual-motor in nature, since the motor component is basic to the perceptual component" (Rubin, 1985). Roberts & Samuels (1993) wrote, "The development of legible handwriting involves a number of skills, including refinement of motor movements and precision control, efficiency in attending to visual stimuli, and refinement in attending to salient features of a stimulus." These skills apply to both manuscript and cursive handwriting.

The importance of handwriting and the role of a child's natural tendencies in this process need to be further investigated. "There are five general phases that are discernible in children's handwriting development. They overlap and perhaps ought to be thought of as general guidelines for viewing the development of the young writer. Much more research on these stages, and on handwriting in general, is needed to look at the effects of

acquiring handwriting skills in the midst of the composing process” (Graves, 1994).

Natural Tendencies - Manuscript

“Teachers in elementary schools frequently encounter students who have significant difficulty learning and mastering handwriting skills. Also, because young learners naturally exhibit a wide range of developmental levels, several students in a first-grade classroom may not have established the foundation skills necessary for successful handwriting” (Aber, Bachman, Campbell, O’Mally, 1994). Getman (1985) stated, “There is a developmental pattern for the acquisition of the movement skills that is just as applicable to symbolic mastery as it is to the acquisition of any other special movement skill.”

Duvall (1985) studied the basic strokes used to form manuscript letters and found that they parallel the perceptual and motor development of young children. Duvall said that there are three elements necessary to a person’s ability to write. Hand movement, visual memory, and control of movement develops as part of a child’s physical maturation. Sassoon (1983) stated, “To push children into trying to form letters before their hand-eye coordination,

and their ability to perceive or copy, are sufficiently developed, causes tension and probably problems later on. Perception, coordination, and motivation can all be stimulated by permitting play and pattern.”

“Teaching handwriting is a most complex task. The child learns to write letters from the top of the page down and to proceed from left to right. This follows developmental laws and for right-handed people is based on natural development” (Rubin, 1985).

Many students enter school with excitement. “Most children will want to learn to write because they feel that writing and reading will somehow unlock the door to the adult world. Many young children try their hand at writing before they come to school” (Rubin, 1985). They believe they can write, and have already developed their own formation of many letters. These natural tendencies are usually considered bad habits. Sassoon (1983) referred to them as “faults in letter construction.”

Natural Tendencies - Cursive

Rubin (1985) wrote that a great deal of pressure comes from parents and children to change from manuscript to cursive writing. Children see that older siblings and parents write in cursive and want to learn to write that way,

too. Parents feel that children are "progressing" academically when they notice their children writing in cursive.

A research article by Graham (1993), looked into the issue of whether to teach both manuscript and cursive writing. Some educators challenged the desirability of teaching both types of writing, recommending that only manuscript be taught (Groff, 1964; Templin, 1973) or making the more controversial suggestion that only cursive be taught. Neither of these recommendations generated enough support to seriously challenge the traditional approach of teaching manuscript in kindergarten through grade two and cursive in grades two or three. Advocates of teaching only manuscript were unable to overcome tradition. Proponents for the cursive-only approach were unable to effectively counter evidence that manuscript writing is more legible than cursive writing, leads to greater gains in reading achievement, can be written as fast and is easier to learn (Askov & Peck, 1982; Graham & Miller, 1980).

"Surveys indicate that kindergarteners and first graders are taught to print. Cursive handwriting is usually introduced in late second grade or third grade. Instruction typically takes place as a group activity" (Koenke, 1986). Huitt's (1972) study supports Koenke and went on to say supporters of this

approach suggest the manuscript letter strokes are easier to make than cursive letter strokes for young students.

However, an article by Armitage & Ratzlaff (1985) referred to research literature that suggested instruction in cursive writing be withheld from students who have difficulty with manuscript, regardless of when other students are taught.

Sassoon (1983) listed the priorities of handwriting as legibility, speed, and the freedom of a personal hand. She wrote that writing is a measure of maturity and taken as an outward indication of progress. She also mentioned the importance of speed and although many people make it through life adequately with a quick print, the objective for students should be cursive. Sassoon stated, "It is therefore necessary to insist on the correct movement from the earliest days in order to ensure smooth progress to a flowing hand. Children mature at different ages, so training must be progressive." With this progressive training, personal hand styles must also be considered. Sassoon feels that the imposition of a school model against a pupil's natural inclination could lead to unnecessary tensions and real repression of creativity. The problem with this is that most teachers evaluate handwriting by comparing the

students' handwriting to the publishers' models or scales and to that of other students (Manning, 1988).

"Peck, Askov, and Fairchild (1980) recommended more research on particular letter forms that might be more easily formed and therefore taught in introductory handwriting instruction. However, this recommendation was not followed in the 1980's. Future research should include studies that focus on the causes of letter-form errors and the type of instruction needed to produce legible written products as the students progress through school into adulthood" (Dobbie, Askov, 1995).

We must consider types of instructional needs when legible handwriting is the goal. There are differences of opinion on this subject. Froese (1981) stated, "To date there still appears to be no generally accepted definition on legibility." This was evident with Rubin (1985), in which she noted teachers must allow for individual differences in handwriting and that individual handwriting improvement, rather than set standards, should be the criterion used for judging progress. Steve Graham (1992), stated, "For developing difficulties, it is important that teachers identify and address them quickly before they become an established problem. For example, if some of the students in a second grade class are making the transition to cursive script

and experimenting with forming particular cursive letters in their writing, the teacher needs to spot awkward and ineffective approaches to letter formation before they become habitualized.” These letter formation errors are often the child’s natural tendencies in relation to their natural level of motor and perceptual development.

Transition From Manuscript and Cursive

In The McGuffey Readers, Mr. McGuffey presented both manuscript and cursive forms for all the words. This was considered old-fashioned (Getman, 1985). In today’s academic world, instruction in manuscript handwriting is prior to instruction in cursive handwriting (Trap-Porter, Cooper, Hill, Swisher, & LaNunziata, 1984). The reason for this was stated by Huitt (1972), “Proponents of this approach suggest that the manuscript letter strokes are easier to perform than cursive strokes for kindergarten and first-grade students. The similarity between the manuscript letters and reading materials is considered an advantage for beginning readers and writers.”

Rubin (1985) felt that children should be made aware of the differences between manuscript and cursive writing as they make the transition from one to the other. Rubin listed the following differences:

MANUSCRIPT	CURSIVE
1. Letters are straight.	1. Letters are slanted--parallel to one another.
2. Paper is straight.	2. Paper is slanted--to the left for right-handed persons and to the right for left-handed persons.
3. Pencil is lifted from the paper after each stroke.	3. Pencil is not lifted from the paper until the whole word is finished.
4. The letters are all separate.	4. The letters are all connected.
5. The letter t is crossed, and the i and j are dotted after the completion of the letter.	5. The t is not crossed, and the i and j are not dotted until after the completion of the word.
6. Certain letters are more circular.	6. Certain letters are more oval--egg-shaped.

Rubin (1985) said in order for children to be ready to construct letters in cursive, they must have achieved enough coordination to write in manuscript.

“There is a major concern about the difficulty children encounter when making the transition from print to cursive” (Koenke, 1986). He went on to say that research does not show the newer methods or forms of manuscript are better than the more traditional Zaner-Bloser, for children during this transition time to cursive. It is known that learning two different forms of handwriting requires time, and the transition interferes with the development of students’ skills in written composition (Duvall, 1985). Findings by Roberts & Samuels (1993), “indicated that when students are learning new aspects of the handwriting task that their speed of writing decreases. The implications of the study suggest that further investigation is needed in delineating the components of handwriting skills.”

Sassoon (1983) stated that during this transition, “There will be no surprise that a model is seen not as a fixed ‘ideal’ style, but as a guide to the basic letter form combining ease of flow with legibility, from which the child is soon encouraged to depart.”

Duvall (1985) explained that handwriting research has attempted to establish which handwriting style is the most legible and the fastest to write. However, educators attempting to select a style of handwriting instruction,

based on the research evidence, have found conflicting reports, as those stated within this chapter.

CHAPTER III

METHODOLOGY

Population and Sample

This study took place during the 1996-97 school year within a midwestern city school district with approximately 375 students. This school is one of seven elementary schools in this district. The community consists of approximately 26,500 citizens.

The total population of both kindergarten and second grade within the Hook Elementary building in Troy, Ohio participated in this study. A current enrollment list was obtained through the Hook Elementary office early in the fall of 1996. The assessment included 50 kindergarten students and 51 second grade students.

Design

The design for this study was a true descriptive research, describing the students' natural tendencies when using manuscript and cursive writing. It also analyzes the correlational relationship between the natural tendencies using manuscript and the transition when performing cursive writing.

Data and Instrumentation

Students were evaluated on an individual basis throughout the school day over a period of twelve weeks. The evaluation process of each child was completed in approximately 10 to 15 minutes.

The instrumentation for collecting data from the kindergarten students included the manufactured Zaner-Bloser (1986) traditional manuscript letters using lines. These were in flashcard form. Students were shown an alphabet card and asked to duplicate it on a xerox copy of one-inch graph paper. Letters were in alphabetical order. Only one alphabet card was visible at a time. Upper and lower case letters were displayed one after the other. However, students were not asked to duplicate similar upper and lower case manuscript letters due to time constraints.

Zaner-Bloser cursive worksheet reproductions were developed into flashcard form for cursive evaluation with second graders. These students were asked to copy the same letters that were evaluated for the manuscript assessment. The subjects copied each letter onto graph paper using one-inch squares, just as manuscript students had done.

The researcher duplicated each letter, noting starting points, direction of strokes, and order of strokes. Red dots were used to indicate the starting point of each letter. Arrows demonstrated the direction of each stroke and numbers were listed to show the order in which the letters were formed. Those that were correctly made, according to Zaner-Bloser instructional guidelines, were underlined.

Upon completion of the individual evaluation, students were thanked for their participation, and given a sticker and treat.

Analysis

Data was gathered from each individual sheet. This information was analyzed by the University of Dayton's Computer Lab. A computer program was used to complete descriptive statistics on the natural stroke tendencies

used and the correlation between the tendencies in relation to stroke directions between grade levels.

CHAPTER IV

RESULTS

A T-test was run using SAS. A significant difference was found between the two groups of kindergarten students using manuscript writing. Students with natural tendencies for stroking from top to bottom (mean = 29.54) was significantly higher than those students performing the same task except stroking from bottom to top (mean = 19.39).

TABLE 1

**T-test for Differences in Natural Tendencies for
Manuscript Stroke Direction of Kindergarten Students**

<u>t</u>	<u>D.F.</u>	<u>Significance</u>
-8.29	77.9	.0001*
mean = 19.39 (stroke direction bottom to top)		mean = 29.54 (stroke direction top to bottom)

A T-test was run again and a significant difference was found in second grade students demonstrating cursive writing. Students with natural stroke tendencies from bottom to top (mean = 20.61) was significantly higher than those students performing the same task, stroking from top to bottom (mean = 10.46).

TABLE 2

**T-test for Differences in Natural Tendencies for Cursive
Writing Stroke Direction of Second Graders**

<u>t</u>	<u>D.F.</u>	<u>Significance</u>
-8.29	77.9	.0001*
mean = 20.61 (stroke direction bottom to top)		mean = 10.46 (stroke direction top to bottom)

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to observe the natural stroke tendencies students exhibit when using manuscript and cursive writing prior to formal instruction. The study also looked at the relationship between the natural tendencies of manuscript and cursive writing. The questions investigated were stated as follows:

1. What are the natural stroke tendencies children exhibit when writing manuscript?
2. What are the natural stroke tendencies children exhibit when writing in cursive?
3. Is there a relationship between the natural stroke tendencies children exhibit when using manuscript and using cursive?

Procedure

Information for this study was obtained through individual student observations. Each student was observed for approximately ten to fifteen minutes. Kindergarten students were asked to duplicate a total of forty upper and lower case letters, after viewing manufactured cards. Second grade students were asked to duplicate the same letters in cursive after viewing pre-made letter cards. The researcher then duplicated each letter, noting starting points, direction of strokes, and order of strokes.

The data was gathered and analyzed by using a SAS at the University of Dayton computer lab. T-tests were run in which the natural direction of letter strokes was analyzed.

Results

The results for the kindergarten students indicate that a significant number of students' natural tendencies were appropriate to the traditional manuscript letter formation. A larger proportion of students had natural tendencies for stroking from top to bottom. However, a lesser number of students were found to stroke from the bottom to top. One half of the kindergarten students started ten or more of the forty letters assessed by

stroking from the bottom up. All but two of the students observed formed at least one letter by stroking from the bottom up, which is consistent with the formation of cursive letters.

The results of the second grade students, observed using cursive handwriting, indicate that students once again formed letters appropriately when compared to the traditional formation of cursive letters. A larger number of second graders began the cursive process by stroking bottom to top as opposed to those that stroked top to bottom.

Conclusions

The following conclusions can be made as a result of this study:

1. Literature supports the natural stroke tendencies of children as developmentally appropriate in relation to what is formally taught. The results lend themselves to what is appropriately taught in handwriting instruction for each grade level.
2. Kindergarten students are taught letter formation in which they start most letters at the top and stroke down. At about the time students become comfortable with manuscript writing, they are forced to change the majority of their letter formation strokes from bottom to top. This change occurs

during the transition from manuscript to cursive. This transition, which takes place in second or third grade, causes tension and reduces academic performance.

3. This researchers found the natural stroke tendencies of both kindergarten students using manuscript handwriting and second graders using cursive writing support previous research in this area.

Recommendations

1. Despite the findings in this study, the literature supports the need for more research in the area of handwriting, specifically in style, formation, and ease of transition from manuscript to cursive writing.

2. Research should also investigate the amount of time that needs to be devoted to handwriting in the classroom, with a focus on legibility.

3. Students should also be given a degree of freedom in handwriting with legibility as the major objective.

4. The research also recommends more research in the area of handwriting in relationship to where the child is developmentally.

BIBLIOGRAPHY

Aber, M. Bachman, B., Campbell, P. and O'Malley, G. (1994). Improving instruction in elementary schools. Exceptional Children, Spring, 42-50.

Armitage, D. and Ratzlaff, H. (1985). The non-correlation of printing and writing skills. Journal of Educational Research, vol. 78 (No. 3), p. 174-177.

Askov, E. and Dobbie, L. (1995). Progress of handwriting research in the 1980s and future prospects. Journal of Educational Research, 88(6), 339-351.

Duvall, B. (1985). Evaluating the difficulty of four handwriting styles used for instruction. ERS Spectrum, III(3), 13-20.

Farris, P. (1991). Views and other views: handwriting instruction should not become extinct. Language Arts, 68, 312-314.

Froese, V., "Handwriting: practice, pragmatism, and progress," In Research in the Language Arts: Language and Schooling, Victor Froese and Stanley B. Straw, eds. (Baltimore University Park Press, 1981), p. 228.

Graham, S. (October, 1992). Focus on exceptional children. Educational Research, 25(2).

Graham, S. (1993/94). Are slanted manuscript alphabets superior to the traditional manuscript alphabet? Childhood Education, Winter, 91-95.

Graves, D. (1983). Writing: Teachers and Children at Work. Portsmouth, NH: Heinemann Educational Books.

Graves, D. (1994). A Fresh Look at Writing. Portsmouth, NH: Heinemann Educational Books.

Getman, G.N. (1985). Hand-eye coordinations. Academic Therapy 20(3), 261-275.

Huitt, R. (1972). Handwriting: the state of the craft of handwriting. Childhood Education, 48, 219-223.

Koenke, K. (November, 1986). Handwriting instruction: What do we know? The Reading Teacher, 214-216.

Manning, M. (1988). Handwriting instruction. Childhood Education, Winter, 112-114.

Markham, L.R. (1976). Influences of handwriting quality on teacher evaluation of written work. American Educational Research Journal, 13, 277-283.

Peck, M., Askov, E., and Fairchild, S. (1980). Another decade of research in handwriting: Progress and prospect in the 1970's. The Journal of Educational Research, 73(5), 283-2948.

Ratzlaff, H. (1985). The non-correlation of printing and writing skills. Journal of Educational Research, 78(3), 174-177.

Reis, E.M. (1989). Activities for improving the handwriting of learning-disabled students. The Clearing House, 62, 217-219.

Roberts, G. and Samuels, M. (1993). Handwriting remediations: a comparison of computer-based and traditional approaches. Journal of Educational Research, 87(2).

Rubin, D. (1985). Teaching Elementary Language Arts, Holt, Rinehart, and Winston, 287-321.

Schickedanz, J.A. (1986). More Than ABC's: The Early Stages of Reading and Writing. Washington, D.C.: National Association for the Education of Young Children.

Sassoon, R. (1983). The Practical Guide to Children's Handwriting. New York: Thames and Hudson, 7-93.

Trap-Porter, J., Cooper, J.O., Hill, D., Swisher, K., LaNunziata, L. (1984). D'Nealian and Zaner-Bloser manuscript alphabets and initial transition to cursive handwriting. Journal of Educational Research, 77, 343-345.

R002579084