

TEACHING YOUNG STUDENTS WITH AUTISM TO WRITE

A Thesis by

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## TEACHING YOUNG STUDENTS WITH AUTISM TO WRITE

The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts in Teaching.

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## ABSTRACT

Young students with autism and other developmental delays face specific challenges when learning to complete academic tasks, including writing. Through a single subject study, the author examined the use of multiple methods in teaching one kindergarten student with autism and one first grader with autism to write the letters in their names in capital letters without a model. Students were evaluated on letter use and letter legibility. One student was taught to build and identify letters with Handwriting Without Tears (HWT) (Olsen, 2008) sticks, use the HWT magnetic writing board, trace lines, trace their name, write their name with a model and write their name without a model. The other student was taught to write trace their name, write their name with a model and write their name without a model via video modeling.

Both live and video modeling methods were found to be useful in advancing a student to more complex handwriting tasks. Both students in the study advanced – the student utilizing a live modeling method advanced two tasks and the student using a video modeling method advanced one. Both students showed improvement from initial baseline to post-test.

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## CHAPTER ONE

### INTRODUCTION

Autism is a multifaceted disorder referred to as being a spectrum because of the wide variety and severity of symptoms exhibited by people who have it. Because of this it is possible to describe what some people with autism experience some of the time, but no more. Autism has no known cause, except that at least some people with autism have a genetic component (Boutot & Myles, 2011).

Symptoms of autism include a marked deficit in communication (American Psychiatric Association, 2000). Some children have a complete or partial delay in spoken language. Many who are verbal exhibit echolalia, or repetition of words, phrases and sounds they have heard (autismspeaks.org). Some verbal and non-verbal children use augmentative communication, like sign or the Picture Exchange Communication System (PECS) (Pyramid Educational Consultants, 2011). PECS is a way for people to communicate through pictures. For children with autism it is important that subsequently students can learn additional skills, such as answering questions or making observations about text (Boutot & Myles, 2011).

While expressive language is very important, an equally important aspect of communication in children with autism is that some have a serious deficit in receptive language. These children with autism do not understand what is being said (Browder & Spooner, 2011), and therefore may be mistaken as deaf or non-compliant. They are often responsive to visual prompts including pictures, gestures and pointing.

Children with autism generally exhibit deficits in social language and social behavior. Children with autism often either shy away from others, or they interact with others inappropriately, for example, they may not make eye contact (autismspeaks.org). Instead of

looking a communication partner in the eye, they may focus on another part of their body. As one child with autism explained it, “I know people by their shirt.” Some children with autism also have difficulty with Theory of Mind - understanding that other people have feelings and thoughts separate from their own. They do not easily engage in joint attention and they typically play in a way that is below their developmental age (Boutot & Myles, 2011).

Children with autism can have “odd responses to sensory stimuli (American Psychiatric Association p. 72). Some children require less sensory stimulation than is typical and some require more. Light and sound are two more frequent sensory points of contention for children with autism (Boutot & Myles, 2011).

Most, if not all, children with autism exhibit repetitive or “self-stimulatory” behaviors. These can include toe walking, rocking, finger posturing, finger flicking, flapping, staring at things that are spinning or staring at any of the previously mentioned actions (autismspeaks.org, Boutot, 2011). Some higher-functioning students may also have extreme interest in one subject, obsessing about it and talking about it incessantly (American Psychiatric Association, 2000).

Fine and gross motor difficulties plague students with autism. Motor planning, the process of the brain telling the body what to do, is an arduous task. Students with autism also frequently have problems with balance (Boutot & Myles, 2011) and putting movements together (e.g. step-hop for skipping). They also often need occupational therapy to help with difficulty using scissors, coloring and doing pragmatic tasks such as fasteners and tying shoes. However, “... motor difficulties are not a defining feature of autism and are not seen in every individual” (Boutot & Myles, 2011, p. 25).

Writing is dependent on literacy. A student cannot begin to understand the writing of letters unless she assigns meaning to them. This can present difficulty for students with autism,



whose behaviors can result in less time spent with activities geared towards literacy (Narkon, Wells, & Segal, 2011).

Then, the course of learning to write takes a student through a series of developmental steps. According to *The Development of Writing in Children*, they are:

- “1. Scribbling
2. Differentiation between drawing and writing
3. Concepts of linearity, uniformity, inner complexity, symmetry, placement, left-to-right motion, and top-to-bottom directionality
4. Development of letters and letter-like shapes
5. Combination of letters, possibly with spaces, indicating understanding of units (letters, words, sentences), but may not show letter sound correspondence
6. Writing known isolated words – developing sound/letter correspondence
7. Writing simple sentences with use of invented spellings
8. Combining two or more sentences to express complete thoughts
9. Control of punctuation – periods, capitalization, use of upper and lower case letters
10. Form of discourse – stories, information material, letters, etc.” (Klein, 1985, p. 19).

Lev Vygotsky believed that writing was a “natural extension of play” (Klein, 1985, p. 20). Alexander Luria saw writing as a cultural experience, one which evolved as children learned to use more tools and became more skilled (Klein, 1985).

According to Marvin L. Klein in *The Development of Writing in Children* (1985), children acquire writing at around three years old. It is then noted that Luria describes that writing acquisition in “four distinct but overlapping stages:” (p. 25) (1) undifferentiated – very early writing that may have meaning to the writer but not to others (ages 3-5); (2) differentiated –

when the child writes lines that loosely represent other things (ages 4-6); (3) pictographic – mental image drawing (ages 4-6); and (4) ideographic – writing letters (ages 4-9).

### STATEMENT OF THE PROBLEM

No two students with autism are alike. However, there are a few things that many students with autism have in common. Two are difficulty in developing imitation skills (Cardon & Wilcox, 2011) and difficulty with fine motor skills, including writing. These are linked, as students with autism are often visual learners, thus are often taught through imitation (Boutot & Myles, 2011). Because writing is a skill that begets additional skills, such as communication, creativity (Feder, Majnemer & Synnes, 2000), development of sentences and story retelling, it is a crucial skill.

When students with autism are stalled in the process of learning to write, their learning is stunted and they are unable to continue through the development of these and other skills. What strategies can be used to help students with autism learn to write? What research has been done on different modeling strategies? What are some effective modeling strategies for improving students' writing legibility and increasing students' ability to extend their writing from tracing to writing with a model to writing without a model?

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1 Why Writing Is Important**

There are many reasons why writing is important to students, and how they can benefit from having developed writing skills. These include (1) being judged, (2) turning thoughts into words, (3) learning more, (4) necessity, and (5) physical needs.

#### **2.2 Being Judged**

It is widely known that having trouble with handwriting can reflect poorly on the child (Graham, Harris, & Fink, 2000). Handwriting is often seen as "... a reflection of an individual's capabilities" (Feder et al., 2000, p. 197). Even with recent avid use of electronic communication, handwriting remains vital to life – it is still used for many job applications, people still take notes and will be expected to write in many jobs. In school, illegible print and difficulty with spelling can cause a teacher to believe that a child doesn't have the ability to compose, when in fact they do (Graham, 1999).

#### **2.3 Turning Thoughts into Words**

According to Graham et al. (2000), writing for The Center to Accelerate Student Learning, writing and speaking are closely linked, and that when a child has words in her head, it will be harder to bring those to light without the handwriting skills to put them on paper. Finding a way to get words onto paper may get in the way of her processing memory, and may get in the way of higher-order skills like planning and content generation (Graham, 1999, p. 78). She might have the composition skills to get a good grade but be unable to show what she can do.

## **2.4 Learning More**

Writing gives students opportunities to explore topics - their own existing interests, as well as new interests, in more depth (Graham, 2005). An increase in handwriting skill can also increase compositional fluency (Berninger, et al., 1997), so that a student's additional writing will increase in quality as well. It is difficult for a student to branch out and learn more when their handwriting skills aren't fast enough to keep up with what they're keeping in their memory (Graham et al., 2000).

## **2.5 Necessity**

Handwriting can affect every area in a child's academic life (Carlson, McLaughlin, Derby & Blecher, 2009). Writing is frequently required for assignments and homework. "Legible handwriting continues to be an important skill for children to develop in elementary school and difficulty in this area may affect any child's proficiency at schoolwork (Denton, Cope, & Moser, 2006, p. 16). "Handwriting can be viewed as an occupational performance for the school-aged child in that it is an expected skill necessary for functioning in a mainstream classroom environment" (Feder et al., 2000, p. 198).

## **2.6 Physical need**

Children with autism have the potential of neurological differences that cause them to need additional help with learning handwriting (Brown, 2009). "Researchers have discovered significant ... underlying neurological abnormalities that may cause differences in their (students with autism) movements and execution of motor tasks" (Brown, 2009, p. 15). Even students with autism who possess other fine motor skills may not be able to write (Brown, 2009). Students are most frequently referred to occupational therapists for poor handwriting (Case-Smith, 2002), but getting help for such an issue can increase a student's fine motor skills and improve his daily life.

## **2.7 Why Students With Autism Should Be Studied**

Children with autism have two specific issues that impede their learning to write: fine motor impairment (Brown, 2009) and behavior that includes poor joint attention and self-stimulation (Boutot & Myles, 2011). These may not, however, impede their ability to learn to write. This may require creative intervention. In addition, children with autism suffer from anxiety, which could stand in the way of their producing writing under pressure (Corbett, et al. 2010).

## **2.8 The Case for Typing**

In *Take the Pencil Out Of The Process*, Leslie Brown advocates to stop trying to force students with Asperger's and autism to produce handwriting and instead encourage them to write via a keyboard. Her concerns are that with a focus on handwriting, poor writers are paying attention to writing the next letter, not forming cohesive thoughts required to compose well; poor writers are writing as little as possible in order to be done, instead of working through their writing, and "Become (ing) habituated to thinking in as few words as possible so that printed responses may be shortened ..." (Brown, 2009, p. 15). If the latter occurs, and a student's actual thinking habits become truncated, then he will stop thinking in creative and open-ended ways, affecting the entirety of his academic career. If instead a truly struggling child is offered a keyboard to express her thoughts and complete writing assignments, the struggling child has a chance to succeed.

## **2.9 Live Modeling vs. Video Modeling**

Live modeling is having a staff member show a student what is expected of them, sometimes using hand-over-hand techniques (Biederman & Freeman, 2007). Video modeling is

recording someone (a staff person, a third party or the student herself) doing the task one wishes to teach. The student watches the video several times, then attempts the task .

Live modeling has been compared to video modeling in many studies over the years, as early as the early nineties, when a camcorder cost \$1500 and had to be paired with a video cassette recorder (900), a video monitor (\$500) and more (Dowrick, 1991). But Dowrick, as did many authors after him, found that passive (video) modeling, is an effective way to teach students, especially those with autism and other developmental disorders (Biederman & Freedman, 2007, Charlop & Milstein, 1989, Dowrick, 1991,). Now, video cameras are easy to access and producing videos for video modeling can be virtually cost-free.

A study by Cardon and Wilcox (2010) posited that both active and passive modeling were effective for teaching imitation to toddlers with a diagnosis of autism; active modeling produced a slow, steady growth rate and passive modeling produced results more quickly, but then leveled out. Another study mentioned that video modeling was accessible and helps to show tasks to students realistically. It also addressed repetitions and replay speed needed to achieve results – the authors investigated the use of a high rate of viewing repetition (14), and slowed replay speed (Biederman & Freedman, 2007).

Writing is an important skill for students for many reasons from basic (writing your name) to complex (pursuing avenues of interest to write about). Autism offers unique writing difficulties for some students, in part due to difficulty in imitation and fine motor impairment. Given what we know about children with autism and writing, the research question addressed in this research project is: Are live (also called in vivo) modeling and video modeling effective at promoting imitation that results in children with autism’s ability to write their name?

CHAPTER THREE  
METHODOLOGY

**3.1 Participants**

Participants included a kindergarten student and a first grade student, both in categorical autism classrooms in a Traditional Magnet elementary school in an urban school district. Both students were chosen to participate due to their emerging writing skills.

Participant one was a first grade girl, age 7, of African descent. This child had a diagnosis of autism disorder. She was semi-verbal. She knew several words but her articulation was extremely poor. When she spoke, it sounded more like grunts. This student exhibited repetitive, attention-seeking behaviors, as well as self-stimulatory behaviors. She displayed severe difficulty with focus and attention, which kept her from fulfilling her learning potential. Participant two was a kindergarten boy, age 6, of African descent. He had a diagnosis of autism disorder. He had difficulties in motor planning as well as extreme use of self-stimulatory behaviors (finger posturing, bending over to watch his finger movements and staring at his finger movements for enough of his day that it interfered with his functioning). He was verbal but when asked a question often mumbled and appeared unable to raise his voice or speak.

The two students were randomly assigned to one of two treatment conditions, either the live modeling model or the video modeling model of learning to write their name in capital letters without a model. Names were placed in a box and were drawn at random by the school nurse. Interventions were also placed in a box and were drawn at random by the school nurse. The first student name drawn was assigned the term “Student 1,” and was matched with the first intervention name drawn, video modeling. The second student name drawn was assigned the

term, “Student 2” and was matched with the second intervention name drawn, live modeling. Intervention sessions were completed in addition to students’ regular writing instruction at school, which was similar to live modeling.

### **3.2 Materials**

Materials for the study of live modeling model included Handwriting Without Tears (HWT) building sticks (big line, little line, big curve, little curve) along with a HWT blue mat. Materials also included the HWT magnetic writing board with magnetic pieces (big line, little line, big curve, little curve) and accompanying yellow magnetic writer. The researcher also used HWT gray blocks paper, pencils and computer-generated tracer pages with the child’s name in capital letters on it. Depending on the intervention, these had either the student’s name alone (see Appendix A) or the student’s name with lined space below the name. With the latter, the student’s name was traced on the paper with a dark marker (see Appendix B). With video modeling, this was done ahead of time. With live modeling, this was done by the researcher in front of the student.

### **3.3 Settings**

Live modeling sessions took place at the writing center table in the child’s own classroom. The student using the video modeling intervention viewed the videos in the classroom’s small, shielded computer area. He completed writing sheets at a table right outside of the computer area. Sessions were conducted when times were available. The number of sessions varied in frequency over the weeks. Each intervention session took between three and seven minutes. Longer times occurred when a portion of the time was spent by Student 1 watching the video.



### **3.4 Assessment**

Students were assessed throughout the study. When tracing lines, students were assessed on whether four of five lines were complete. When tracing their name, students were assessed on whether 80% of letter lines were touching, and whether 80% of letters were recognizable. When writing their name with or without a model, students were assessed on whether 80% of letter lines were touching, whether 80% of letters were recognizable and whether all letters were correct and in the correct order. For each task, the corresponding set of criteria had to be complete (each individual criteria must have the answer ‘yes’) in order for the task complexity to be increased.

### **3.5 Procedure**

Student 1 and Video Modeling: Using a single subject design, a baseline was established over three sessions. During the first baseline session, Student 1 was directed to “write your name” on a sheet of paper with a box provided in which the student was to write his name (see Appendix C). Student 1 did not complete the task. During the second baseline session, Student 1 was directed to “trace your name” on a sheet with the student’s name printed on it in dotted lines (see Appendix A) Student 1 did not complete the task. During the third baseline session, Student 1 was directed to “trace the lines” on a sheet with vertical lines and circles printed on it in dotted lines (see AppendixD). Student 1 completed this task successfully. Therefore, after baseline, it was determined that Student 1 would begin working sessions with the intervention “trace your name.” Intervention was initiated and continued over ten sessions. At the start of each session, Student 1 watched the video of an older student performing the task eight-ten times. Next, Student 1 was given one verbal direction, and attempted the task on his own. For sessions 1-4, Student 1 watched a video of an older student tracing Student 1’s name. After watching the video

ten times for the first session and eight times for sessions 2-4, Student 1 was directed to “trace your name” on a sheet identical to the one in the video (see Appendix A). For sessions 5-10, Student 1 watched a video of an older student writing Student 1’s name with a model. The model was written on the sheet prior to the video’s production. After watching the video eight times, Student 1 was directed to “write your name here” with the researcher pointing to the space where the name should be written on a sheet identical to the one used in the video (see Appendix B). Protocol indicated that intervention continue for ten sessions. After the tenth session, protocol indicated that intervention end. Post-test was administered – Student 1 was directed to “write your name.”

Student 2 and Live Modeling: Using a single subject design, a baseline was established over three sessions. During the first baseline session, Student 2 was directed to “write your name” on a sheet of paper with a box provided in which the student was to write her name (see Appendix C). Student 2 did not complete the task. During the second baseline session, Student 2 was directed to “trace your name” on a sheet with the student’s name printed on it in dotted lines (see Appendix A) Student 2 did not complete the task. During the third baseline session, Student 2 was directed to “trace the lines” on a sheet with vertical lines and circles printed on it in dotted lines (see Appendix D). Student 2 did not complete this task successfully. Therefore, it was determined that Student 2 would begin intervention with the intervention “trace lines.” Intervention was initiated and continued over ten sessions At the start of each session, Student 2 was given either one or two specific instructional interventions, then Student 2 was given one verbal direction, a specific task was modeled for her by the researcher, and she attempted the specific task on her own. For working session 1, Student 2 created vertical lines and circled with HWT sticks, and practiced tracing vertical lines and circles over highlighter on a separate sheet.

Then she was given a sheet with vertical lines and circles printed on it in dotted lines (ten figures in all) and was given the verbal direction, “trace lines.” Student 2 did not complete this task. For session 2, Student 2 used HWT magnets to produced vertical lines and circles, then she was given a sheet with vertical lines and circles printed on it in dotted lines (ten figures in all) and was given the verbal direction, “trace lines.” Student 2 was successful in completing this task, and the task for session 3 was therefore increased in complexity. For session 3, Student 2 used HWT sticks to create the letters E and R on a blue mat, and she practiced tracing the letters K and Y. She was then given a sheet with her name printed on it in dotted lines (see Appendix A) and was given the verbal direction, “trace your name.” Student 2’s attempt met the criteria for completion and her success indicated an increase in complexity for session 4. For session 4, Student 2 used HWT sticks to create the letter Y and practiced tracing the letter Y. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 5, the student used HWT magnets to create the letters K,E and Y. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 6, Student 2 practiced tracing the letters R and A. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on

top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 7, Student 2 was given her name to practice tracing. She traced her name five times. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 8, Student 2 practiced tracing the letters Y and E. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 9, Student 2 made the letters R, K and E with HWT magnets. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete the task. For session 10, Student 2 practiced tracing her name five times on a practice paper. She was then given a sheet with her name printed in dotted lines at the top, and underneath was a blank lined area for her to write her name (see Appendix B). The researcher traced the name on top in front of the student. Then, the student was given the direction, “write your name here,” with the researcher also pointing to the spot where the student was to write her name, The student did not complete

the task. Protocol indicated that intervention continue for ten sessions. After the tenth session, protocol indicated that intervention end. Post-test was administered – Student 2 was directed to “write your name.”

## CHAPTER 4

### RESULTS

It was determined that, as a result of baseline data, Student 1 (i.e., Video Modeling) would begin intervention with tracing his name. For Sessions 1-4, Student 1 watched the video of an older student tracing Student 1's name. For the first session Student 1 watched the video 10 times. However, because Student 1 required several prompts to stay on task after eight viewings of the video, future sessions were kept to eight viewings in order to maximize attention and on-task behavior. After watching the video ten (or eight) times, Student 1 was taken to a table right outside of the computer area and was given an appropriate piece of paper (e.g. one with his name in dotted lines) (see Appendix A). and one verbal direction (e.g. 'trace your name'). At session four, Student 1 completed the required criteria for tracing his name. For sessions 5-10, Student 1 began the intervention task of writing his name with a model (see Appendix B). For each of the remaining sessions, Student 1 repeated the aforementioned procedures, watching a video of an older student writing Student 1's name with a model eight times, then given a paper with his name already written on it in marker, with a lined area underneath for him to write his name, and one verbal direction (e.g. 'write your name'), and attempting the task. At session 10, Student 1 had not completed all of the criteria established for writing his name with a model, that 80% of letter lines were touching, that 80% of letters were recognizable, and that all letters were correct and in the correct order.; therefore, the intervention was ended. Posttest data was then taken in one session, where Student 1 was provided a box on a piece of paper and given one verbal direction, 'write your name' (see Appendix C). As a result of posttest data, it was determined that Student 1 had not accomplished the task, 'write your name.'

It was determined that, as a result of baseline data, Student 2 (i.e., Live Modeling) would begin intervention with tracing lines. At session one, Student 2 practiced making a vertical line and a circle with HWT sticks. Student 2 was then asked to trace vertical lines and circles on a tracing sheet. Criteria were not met (that 80% of lines were complete). At session two, Student 2 worked with the HWT magnet board and practiced making vertical lines and circles with it, then Student 2 was asked to trace vertical lines and circles on a tracing sheet. Student 2's work met the criteria for increasing the complexity of the task. For session three, Student 2 practiced making the letters E and R with HWT sticks and tracing the letters K and Y on HWT gray blocks papers. Then, after watching her name traced on her specially-designed tracing paper (See Appendix B), Student 2 traced her name on the paper. Criteria were met for increasing the complexity of the task (that 80% of letter lines were touching, and 80% of letters were recognizable). For sessions four through ten, Student 2 attempted the task of writing her name without a model. Before each session, Student 2 was asked to trace individual letters or her name, make letters with HWT sticks, or use the HWT magnet board to practice writing individual letters. Before attempting to write her name without a model, Student 2 watched her name being written. After session ten, intervention was ended. Posttest data was then taken in one session, where Student 1 was provided a box on a piece of paper and given one verbal direction, 'write your name.' As a result of posttest data, it was determined that Student 1 had not accomplished the task, 'write your name.'

Because no two students with Autism are alike, and because their uniqueness leads research to investigate new ways to teach students with Autism to write, this research looked at whether live modeling and/or video modeling are effective strategies for teaching students with

autism to write. Figure 1 shows Student 1’s progress throughout the intervention. For Student 1, the Video Modeling strategy was used.

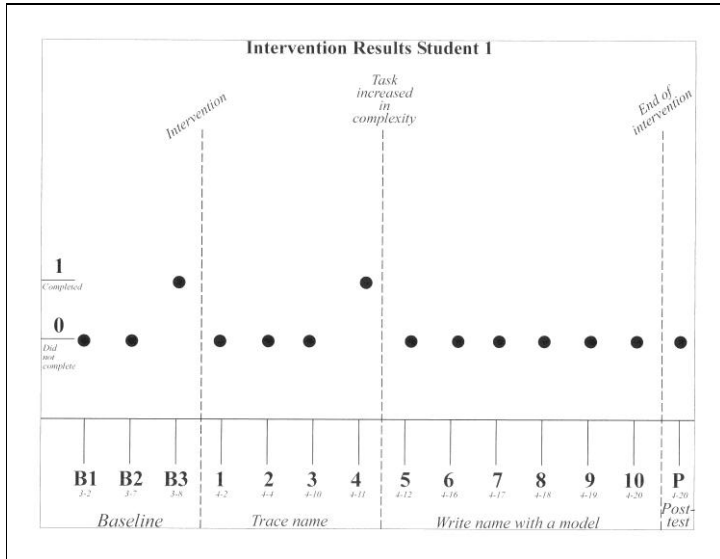


Figure 1: Student 1’s progress throughout the Video Modeling intervention

Baseline data showed that Student 1 was already successful at one-third of baseline tasks. Student 1 attempted to trace his name four times, and was successful at tracing his name on his fourth try. For sessions 5-10, Student 1 attempted to write his name without a model. Student 1 did not successfully write his name with or without a model during this intervention protocol. On the post-test, when given one verbal direction, “write your name.” no name was written. However, at the post-test task, “write your name,” Student 1 made three marks in the box to represent letters (there are six letters in his name), and at post-test he wrote five.

Figure 2 shows Student 2’s progress throughout the intervention. For Student 2, the Live Modeling strategy was used. Baseline data showed that Student 2 was unsuccessful at 100% of



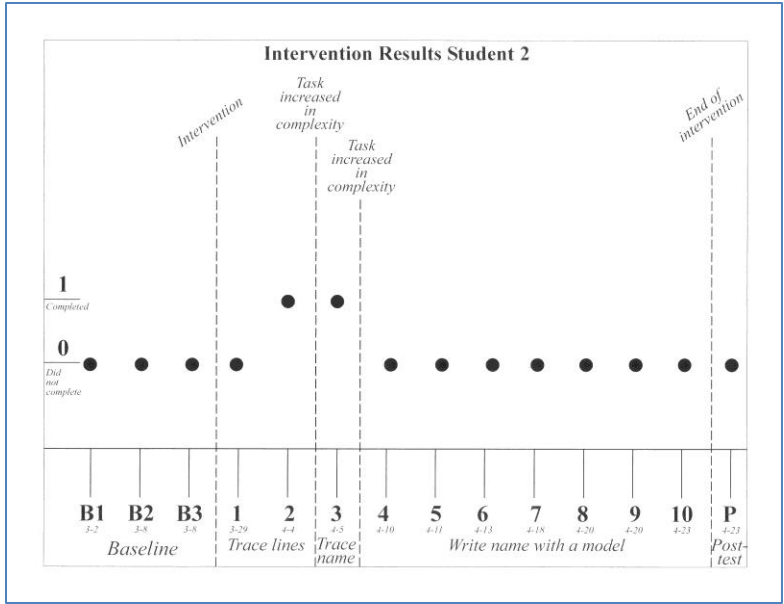


Figure 2: Student 2’s progress throughout the Live Modeling intervention

baseline tasks.

Data showed that Student 2 attempted to trace lines two times, and met the criteria for completing this task on the second try. Student 2 attempted to trace her name one time and was successful. For sessions 4-10 Student 2 attempted and was unsuccessful at writing her name with a model. At post-test, when given one verbal direction, “write your name,” no name was written. However, at baseline task “write your name,” Student 2 wrote two recognizable letters and at post-test she wrote five out of the six letters in her name correctly, recognizably and in order.

Figure 3 shows how long (for how many sessions) Student 1 (video modeling) spent attempting each task. Student 1 spent three sessions in baseline, then four sessions tracing his name, six sessions writing his name with a model, and one session in post-test.

	Task	# of Sessions
Student 1 (video)	<b>Baseline</b>	<b>3</b>
	<b>Trace Name</b>	<b>4</b>
	<b>Write name w/model</b>	<b>6</b>
	<b>Post-test</b>	<b>1</b>

Figure 3: Number of sessions Student 1 spent addressing each task

Figure 4 shows how long (for how many sessions) Student 2 (live modeling) spent attempting each task. Student 2 spent three sessions in baseline, then two sessions tracing lines, one session tracing her name, seven sessions writing her name with a model and one session in post-test

	Task	# of Sessions
Student 2 (live)	<b>Baseline</b>	<b>3</b>
	<b>Trace Lines</b>	<b>2</b>
	<b>Trace Name</b>	<b>1</b>
	<b>Write name w/model</b>	<b>7</b>
	<b>Post-test</b>	<b>1</b>

Figure 4: Number of sessions Student 2 spent addressing each task

Figure 5 shows what criteria were met by Student 1 during each session of video modeling intervention. In Baseline Write Name and Trace Name, Student 1 did not meet any criteria. In Baseline Trace Lines, Student 1 met one criterion out of one possible criterion. In the following ten sessions of video modeling intervention, Student 1 met a total of seven criteria out of a possible 26. Student 1 was slated to move on to a more complex task once. In pre-test he met no criteria.

	What was	Are 80% of	Are 80% of letter	Are 80% of letters	Are all letters	
Date	attempted	lines complete?	lines touching?	recognizable?	correct & in order?	Move on?
2-Mar	B-write name	N/A	N	N	N	N
7-Mar	B-trace name	N/A	N	N	N/A	N
8-Mar	B-trace lines	Y	N/A	N/A	N/A	Y
2-Apr	trace name	N/A	N	Y	N/A	N
4-Apr	trace name	N/A	N	Y	N/A	N
10-Apr	trace name	N/A	N	N	N/A	N
11-Apr	trace name	N/A	Y	Y	N/A	Y
12-Apr	write name w model	N/A	N	N	Y	N
16-Apr	write name w model	N/A	N	N	N	N
17-Apr	write name w model	N/A	N	Y	N	N
18-Apr	write name w model	N/A	N	N	N	N
19-Apr	write name w model	N/A	N	N	N	N
20-Apr	write name w model	N/A	Y	N	N	N
20-Apr	B-post-test	N/A	N	N	N	N

Figure 5: Criteria met during each session of Student 1’s video modeling intervention.

Figure 6 shows what criteria were met by Student 2 during each session of live modeling intervention. In all three Baseline sessions, Student 2 met no criteria out of a possible six. In the following ten sessions of intervention, Student 2 met criteria 12 times out of a possible 25. In post-test, Student 1 met two of three criteria.

	What was	Are 80% of	Are 80% of letter	Are 80% of letters	Are all letters	
Date	attempted	lines complete?	lines touching?	recognizable?	correct & in order?	Move on?
2-Mar	B-write name	N/A	N	N	N	N
8-Mar	B-trace name	N/A	N	N	N/A	N
8-Mar	B-trace lines	N	N/A	N/A	N/A	N
29-Mar	trace lines	N	N/A	N/A	N/A	N
4-Apr	trace lines	Y	N/A	N/A	N/A	Y
5-Apr	trace name	N/A	Y	Y	N/A	Y
10-Apr	write name w model	N/A	Y	N	Y	N
11-Apr	write name w model	N/A	Y	N	N	N
13-Apr	write name w model	N/A	N	N	Y	N
18-Apr	write name w model	N/A	Y	N	Y	N
20-Apr	write name w model	N/A	N	Y	N	N
20-Apr	write name w model	N/A	N	N	N	N
23-Apr	write name w model	N/A	Y	N	Y	N
23-Apr	B-post-test	N/A	Y	N	Y	N

Figure 6: Criteria met during each session of Student 2’s live modeling intervention.

## CHAPTER 5

### DISCUSSION

#### 5.1 Overview

Overall, both live modeling and video modeling methods were useful in producing some results over the course of intervention (Biederman & Freedman, 2007; Charlop & Milstein, 1989; Park, et al., 2007). In previous research, video modeling strategies had primarily been used to teach students speech or social behavior (Charlop-Christy, et al., 2000). In this research, using the video modeling method, Student1 moved from tracing his name to attempting to write his name with a model, making progress through the course of intervention. In addition, his baseline attempt at writing his name (three marks on the paper to represent six letters in his name) was improved upon at posttest (five marks on the paper).

Live modeling has been used frequently to help teach young students with and without disabilities to write, and to write their name (Park, et al., 2007). Here, using the live modeling method, one student was able to move from simply tracing lines to competently tracing her name, and this student wrote her name without a model in posttest using four of six recognizable letters and using all letters correct and in order. Although this was not enough to have the task ‘write your name without a model’ complete, it was an improvement over her baseline task, in which she produced two recognizable letters and five out of six letters correct and in order.

In each intervention, results did show a small upward trend in skill acquisition. So, given a longer length of time for intervention, one would expect results to continue to show additional skill acquisition. This contributes to the available literature in that it shows that these interventions worked, and in addition showed that they worked when used consistently and repetitively. When applying this information in a classroom or another intervention arena, a

practitioner may want to evaluate the child's attention ability, enjoyment of adult attention, or of television viewing before choosing an intervention to use.

“Good writing is essential to children's success in school (Graham, 2005, p. 587). The literature shows that writing is important for student development and life skills and that students can learn more if they are able to write (Graham, 1999). Students 1 and 2 will both use their acquired skills to write their name on papers completed in the classroom, which is one of the reasons that writing is important. In addition, the fine motor skills they have developed as a result of intervention will generalize to the skill of writing numbers, which will allow them to proceed to additional skill building in math. They will be able to write the answers to problems, and so will be able to move on to more abstract math concepts, instead of simply using manipulatives or pictures. In addition, the development of writing-based fine motor skills also advances the development of other fine motor skills, such as doing and undoing buttons and tying shoes.

## **5.2 Limitations**

Sample size and length of time of intervention limit the generalizability of this study. In addition, the uniqueness of students with autism limits the generalizability as well. Limitations of data collection hamper the interpretation of what features of intervention worked best. In addition, general information was collected pre-intervention about each student, but detailed information about student developmental assessment scores, family history, or current academic levels not related to writing was not collected.

Generalizability is also limited by the fact that students received regular writing instruction, including in writing their name, during regular instruction time at school, and information about that instruction is not included here.

### **5.3 Future Research**

Students who receive specialized instruction, whether via video modeling or live modeling, in writing-based fine motor skills can increase their skill level and are able to use those skills in more than one academic arena. Future research should more deeply flesh out the difference between skill acquisition when utilizing video modeling and live modeling. In addition, future research should look carefully at student background and analyze what aspects of prior academic and developmental levels affect the ability of students to acquire skills related to writing and fine motor tasks. For example, if a student has been receiving Occupational Therapy services, the therapist might have data that indicates potential progress. Or, the *Assessment, Evaluation and Programming System (AEPS)* (Brooks Publishing Co., 2002) or similar developmental assessment could be administered in order to determine developmental levels. Finally, future research should implement interventions for a longer period of time in order to more fully realize the potential of both interventions.



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## BIBLIOGRAPHY

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## **APPENDICES**

**APPENDIX A**

**Trace Your Name**

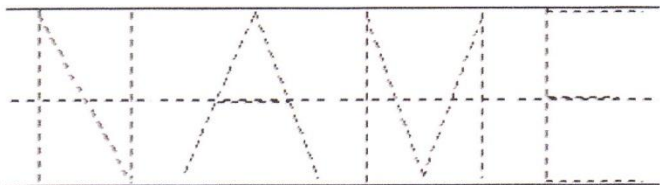


Figure 6: Material used for the “Trace your name” task.

**APPENDIX B**  
**Write Your Name With A Model**

NAME

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Figure 7: Material used for the “Write your name with a model” task.

**APPENDIX C**

**Write Your Name**

**Write your name**

A large, empty rectangular box with a thin blue border, positioned centrally below the text. It is intended for the student to write their name in.

Figure 8: Material used for the “Write your name without a model ” task.

**APPENDIX D**

**TRACE LINES**

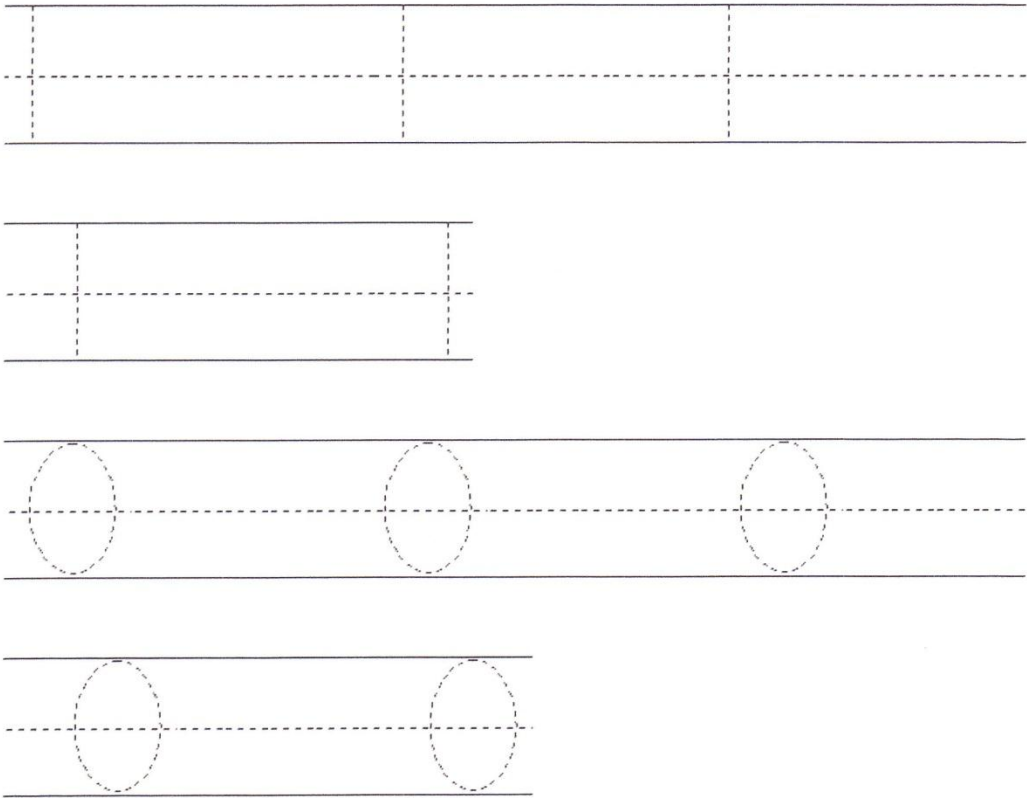


Figure 9: Material used for the “Trace lines” task.