

# Using Tracing and Modeling with a *Handwriting Without Tears*<sup>®</sup> Worksheet to Increase Handwriting Legibility for a Preschool Student with Autism

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**Abstract:** The purpose of this study was to increase the legibility of letter writing using a tracing procedure derived from the *Handwriting Without Tears*<sup>®</sup> program [1]. Our participant was enrolled in a self-contained special education preschool classroom. The child was expected to move on to an integrated kindergarten during that next school year, so gaining handwriting skills and being able to write her name should increase her chances for success. During baseline, she could only write one of the six letters in her first name. When tracing the letters of her first name on a *Handwriting Without Tears*<sup>®</sup> worksheet and then copying the letters, the writing of the letters in her name increased. Overall, our results suggest that the use of the *Handwriting Without Tears*<sup>®</sup> worksheet along with a visual model can increase the participant's ability to write letters. The efficacy of employing these procedures is discussed.

## USING TRACING AND MODELING WITH A *HANDWRITING WITHOUT TEARS*<sup>®</sup> WORKSHEET TO INCREASE HANDWRITING LEGIBILITY FOR A PRESCHOOL STUDENT WITH AUTISM

Handwriting is an important skill that can impact a student's performance across all academic areas [2-4]. Development of this skill often takes place in the primary grades, often in kindergarten. Even with the advent of computer technology, handwriting legibility remains a skill that has important use for children on state-wide assessments and later to college entrance exams.

Multiple techniques have been shown to be successful in teaching children handwriting skills [5, 6]. Thus, improving handwriting has been viewed as an important goal in school by a wide range of school personnel [4, 7, 8]. Behavioral research by McLaughlin and Walsh [9] examined use of explicit instruction for teaching students with developmental disabilities to write their own names. Explicit instruction with prompting, praise, and task analysis was shown to improve the name writing skills for middle school students with moderate mental retardation. In a more recent study with preschool children, [10] we were able to improve the legibility of two children handwriting using modeling, prompting, and direct instruction procedures.

With the large increase in the number of children identified with an autism spectrum disorder (ASD), developing procedures to improve the academic success of such children appears warranted [11]. Several researchers have indicated that students with autism can benefit from systematic or additional instruction [6, 12]

In many school districts, occupational therapists (OT's) have been assisting teachers in providing handwriting

instruction for students with autism [13]. Two recent reports suggested that OT's can assist teachers in handwriting instruction [14]. Unfortunately, a between groups data-based comparison, [15] between handwriting instruction, kinesthetic training, to that of a no treatment control group, found that neither approach was statistically superior to that of no treatment control group. However, Sudsawad *et al.* [15] felt that if the participants would have been older, maybe such differences would have been found. Case-Smith [16] suggested the *Handwriting Without Tears*<sup>®</sup> program [1] for teaching handwriting to students. This pre-k through grade 5 program comes with teacher's guides, workbooks, special materials, and on-sight training. Case-Smith [16] felt that the HWT curriculum used a developmental approach by grouping letters by difficulty and employing a teaching a style that employs simple vertical lines. Finally, there is a diverse literature that supports the teaching of a simple vertical style [3]. However, very little empirical support has been published in the peer-reviewed literature as to the efficacy of the *Handwriting Without Tears*<sup>®</sup> program.

The purpose of this study was to evaluate an increase in the legibility of the letters can be obtained using the procedures based on the *Handwriting Without Tears*<sup>®</sup> program [1] could be observed with a preschooler diagnosed with autism. Writing her name was judged an important pre-skill; as it was hypothesized that this would increase the child's readiness for later success in a kindergarten classroom.

## METHOD

### Participant and Setting

Our participant ("Navola") was a 5-year 3-month old girl named previously diagnosed with autism. She was diagnosed with autism at age of 3 by a licensed pediatrician. She was enrolled in a self-contained special education preschool classroom. Navola was chosen for this study because she had

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been unable to legibly write all but one letter in her first name prior to the study. She was scheduled to move up to kindergarten during the next school year, where the expectation each letter of the alphabet and one's name are correlated with school success.

The study took place in a self-contained special education preschool classroom at a local elementary school in the Pacific Northwest. Navola had attended school for one school year and was attending a morning session. The number of students present in the class ranged from 10 to 12 students. Data were collected at the end of the morning session, at approximately 11:30 a.m. Each session lasted up to ten minutes within a one-on-one instructional context.

**Materials**

The materials used in this study were from the *Handwriting Without Tears*® program. Worksheets for each of the six letters in the participants name (L,A,V,O,N, A) as well as worksheet with participant's first name (LAVONA) were used from the "Get Ready For School" *Handwriting Without Tears*® workbook [1]. The student was offered several color choices when choosing a marker to use to complete her worksheet.

**Experimental Design**

A multiple baseline design [17] across letter pairs was employed to evaluate the effects of the handwriting intervention. A description of the various conditions follows.

**Baseline**

Navola was given a piece of paper with their name printed on the top (See Fig. 1). She was given the directions, "Write L", after the completion of that letter; the same directions were repeated for the five remaining letters in the participants' name ("NAVOLA"). The number of sessions in baseline ranged from 2 (L, A) to 9 sessions (N, A).

**Handwriting Without Tears® Worksheet with Individual Letter Instruction and Modeling**

After baseline, the participant was given were given a *Handwriting Without Tears*® [16] worksheet for the specified letters and the instructor used the verbal prompt, "We're

going to write the letter \_\_\_\_". The instructor then verbally prompted using the *Handwriting Without Tears*® prompt. Specifically, for the letter L, the instructor verbally prompts, "Start at the top, big line down, little line across," for the letter A, "Start at the top, big line slides down to the corner, jump back up to top, big line slides down to the other corner, little line across," for the letter V, "Start at the top, big line slides down and up," for the letter O, "Start at the top, make a magic C, big curve to the bottom, keep on going to the top," for the letter N, "Start at the top, big line down, frog jump up to the starting corner, big line slides to bottom corner, big line up like a helicopter." Upon completion of the worksheet she was presented with the same sheet of paper used in baseline for increased practice in tracing and copying from a model for each letter set. Once Navola received two points for the letters being targeted for at least two consecutive sessions, she was able to move to the next letter set.

**Interobserver Agreement for Legibility and Fidelity of the Independent Variables**

Interobserver agreement was conducted for 100% of the sessions. Navola's handwriting was regraded by another independent scorer. Scoring was masked when these papers were rescored. Letters were scored based on the two criteria; size and legibility. Interobserver agreement was calculated by dividing the number of agreements by the sum of the agreements and disagreements and multiplying by 100. An agreement was scored if each person scored the letter in the same manner. Any deviation in scoring was labeled a disagreement. The mean agreement was 89.7% across the investigation. Reliability as to the fidelity of implementing the various experimental conditions was determined from classroom observation and from the permanent product recording for the various sessions. Implementation for both baseline and the intervention procedures was 100%.

**RESULTS**

**Baseline**

In the baseline for the letters L, A, Navola had a mean score of 1.0 points. For letters V O, the number of points

Student's Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Baseline: \_\_\_\_\_ Intervention: \_\_\_\_\_

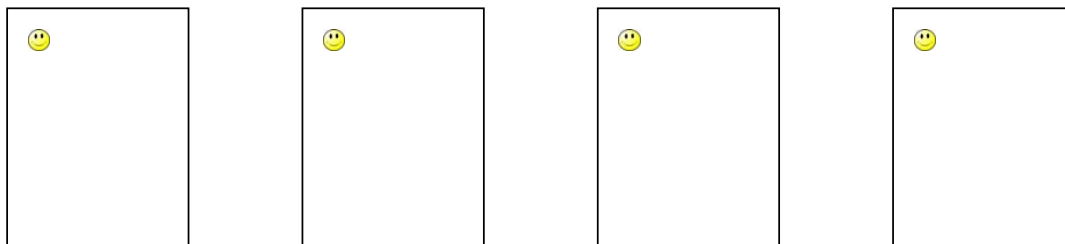
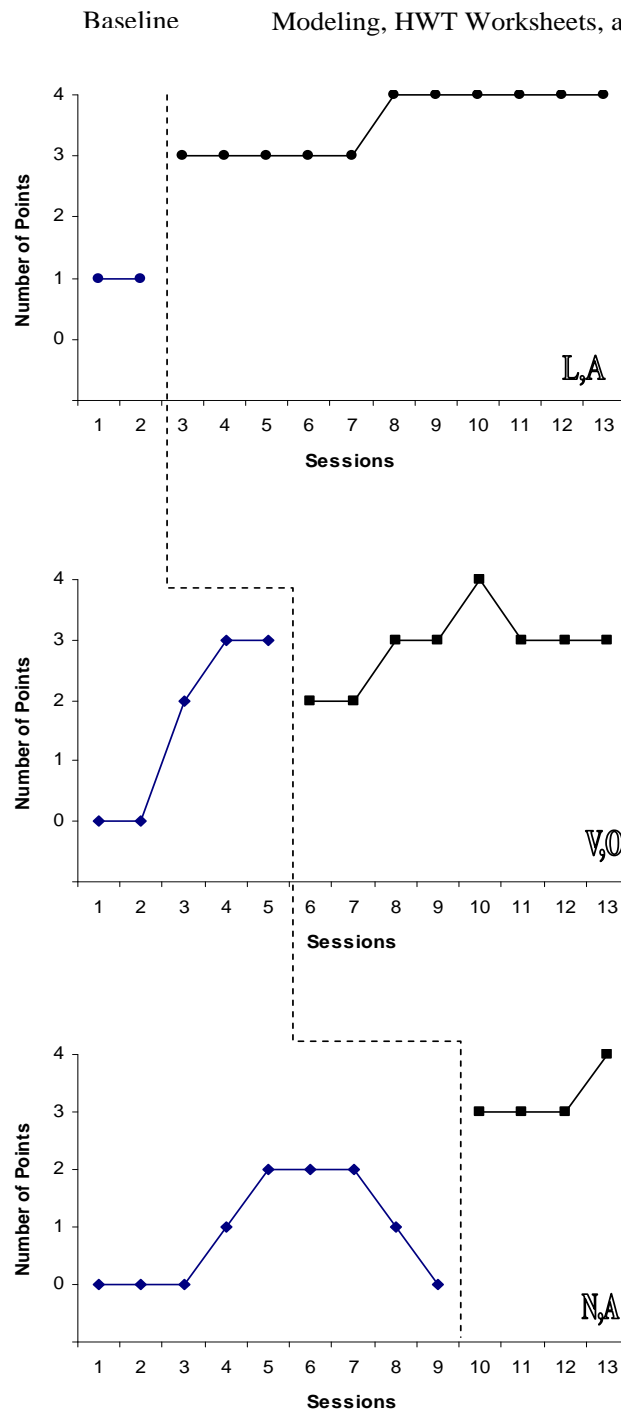


Fig. (1). Example of the handwriting sheet for all six letters.



**Fig. (2).** The number of points for size and legibility for the three letter pairs for baseline and *Handwriting Without Tears*<sup>®</sup>, a visual model and tracing.

earned ranged 0 to 3 with an overall mean of 1.6. The number of points for the letters N, A, ranged from 0 to 2 with an overall mean of 1.83 (Fig. 2).

***Handwriting Without Tears*<sup>®</sup> Worksheet with Individual Letter Instruction and Modeling**

For the letters L, A, Navola increased her performance with an overall mean of 3.9 (range 3 to 4). For the letters V,

O, the participant increased her legibility to a mean of 2.87 (range 2 to 4). For the letters N, A, Navola improved her legibility scores to mean of 3.25 with a range of 3 to 4.

**DISCUSSION**

Our results indicate that the use of the *Handwriting Without Tears*<sup>®</sup> worksheets along with a model can increase the legibility of handwriting. This outcome provides some

initial evidence as to the possible efficacy for the *Handwriting Without Tears*® curriculum [1].

Four key strengths of the investigation should be noted. First, the participant's ability to work on the letters of her name increased her letter recognition skills. Second, Navola became familiar with the *Handwriting Without Tears*® format, which she may encounter later in their education. Third, the procedures were easily employed in any classroom. Specifically it took little time and with little cost. The classroom teacher we worked with already had the supplies for the study. For teachers who do not, once they have been purchased, they can easily be used for all the children in the classroom. Lastly, we demonstrated that employing these procedures with a preschool student with autism can be effective.

Three limitations need to be noted. First, classroom attendance was extremely variable. This was due to illness and her mother not having any means of bringing her to school. We hypothesize that the performance would have been enhanced if attendance would have been more consistent. Second, we employed only a single participant. Third, long-term follow data collection was unable to be carried out. Finally, we could have easily included more of the materials from the *Handwriting Without Tears*® program (magnet board or chalk board) which could have increased performance. However, we ended data collection before this could be employed. The use of additional practice and intervention in handwriting has been suggested by several researchers in the special education [6-8] and occupational therapy [4, 14, 16]. Overall, the present case report provides a partial replication of some of our work with modeling, tracing, and explicit instruction to improve the handwriting [9-10].

The present case report begins to build an evidence-based practice data set [18] for the *Handwriting Without Tears*® program. In the present analysis, a single preschooler with autism improved her skills in writing her name. This provides a data-based replication on the use of materials recommended by the occupational therapists [1] for use in the classroom. Finally, many of the procedures outlined and recommended in the *Handwriting Without Tears*® program were successful with our participant. This replicates much of our recent research dealing with *Handwriting Without Tears*® [19, 20].

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