



Teaching Preschool Children with Autism and Developmental Delays to Write

**Brittany Carlson¹, T. F. McLaughlin¹,
K. Mark Derby¹, Jessiana Blecher²**

¹ Special Education, Gonzaga University, Spokane, Washington

² Spokane Public Schools, Spokane, WA

USA

Postal address: *Thomas McLaughlin*. Department of Special Education, Gonzaga University, Spokane, WA 99258-0025. USA E-mail: mclaughlin@gonzaga.edu; tim.mclaughlin6@comcast.net

© Education & Psychology I+D+i and Editorial EOS (Spain)

Abstract

Introduction: *Handwriting Without Tears*® program (Olsen, 1998) has been suggested as an appropriate set of procedures to teach students with and without disabilities skills in written communication. Unfortunately, there has been little research in the peer reviewed literature where the program has been employed to teach children with autism /and or developmental delays handwriting

Objectives: The purpose of this study was to increase the legibility of letters using tracing procedures from the *Handwriting Without Tears*® program (Olsen, 1998).

Method: The program was implemented to teach two preschoolers with autism or developmental delays four developmentally appropriate letters. A multiple baseline design (Kazdin, 1982) was employed to assess the effects of the *Handwriting Without Tears*® program. Two preschool students with autism were our participants. The data collection and procedures were carried out in a special education preschool classroom. The number of legible letters were scored.

Results: Our outcomes indicated that during baseline neither participant could legibly write the letters chosen for study. The outcomes of this study also indicated that the use of the *Handwriting Without Tears*® chalkboard and worksheet along with a highlight, model and start point, can increase a students' ability to write specified letters. This finding was replicated across all of the participants.

Discussion: The evidence from the present action research supports the use of portions of the *Handwriting Without Tears* program. These was found for preschool students ASD. The use of these procedures were discussed.

Key words: Autism, Handwriting without Tears, Explicit Instruction Instruction, Handwriting

Received: 09/04/08 *Initial Acceptance:* 01/09/09 *Final Acceptance:* 02/23/09

Resumen

Introducción: El programa *Handwriting Without Tears*® (Olsen, 1998) ha sido considerado como un conjunto de procedimientos adecuados para la enseñanza de la escritura para niños con y sin discapacidad. Desafortunadamente, existen pocas investigaciones sobre la utilidad de dicho programa en la enseñanza de la escritura.

Objetivos: El propósito del estudio es incrementar la legibilidad de las letras utilizando los procedimientos de trazado del programa *Handwriting Without Tears*® program (Olsen, 1998).

Método: El programa se implementa para desarrollar la escritura de letras de dos alumnos autistas de educación infantil. Los efectos del programa *Handwriting Without Tears*® (Olsen, 1998) se evalúan a través de un diseño de línea base múltiple (Kazdin, 1982). La recogida de datos y los procedimientos fueron desarrollados en una clase infantil de educación infantil, evaluándose el número de letras legibles.

Resultados: Los resultados indicaron que, en la línea base, ninguno de los participantes podía escribir de forma legible las letras elegidas para el estudio. Los resultados del estudio también indican que la utilización de la pizarra y la hoja de trabajo del programa *Handwriting Without Tears*® junto con las indicaciones, modelo y punto de inicio, pueden incrementar la habilidad de los estudiantes para escribir determinadas letras. Este hallazgo se repite en todos los participantes.

Discusión: Los resultados obtenidos en la presente investigación apoyan el uso del programa *Handwriting Without Tears*®. Tales hallazgos fueron encontrados en estudiantes diagnosticados como autistas.

Palabras clave: Autismo, Handwriting without Tears, Instrucción Explícita, Escritura.

Recibido: 04/09/08 *Aceptación inicial:* 09/01/09 *Aceptación final:* 23/02/09

Introduction

Handwriting is an important skill that can affect a student's performance across all academic areas (Ainscow, 2005; Graham & Harris, 1999; Graham, Harris, & Fink, 2000). Development of this skill takes place in the primary grades, especially in kindergarten. Children learn how to correctly form the 26 capital and lower case letters of the alphabet, which allows them to write words and form sentences. Multiple techniques have been shown to be successful in teaching children handwriting skills (Alberto & Troutman, 2006; Cipani & Spooner, 1994; Graham, 1999; Graham & Harris, 2002). For example, in behavioral research various consequence-based procedures have been employed to improve the handwriting of students with and without disabilities. These have included token reinforcement (McLaughlin, 1981), academic positive practice and response cost (McLaughlin, Mabee, Reiter, & Byram, 1991), and free time (Hopkins, Schulte & Garton, 1971).

McLaughlin and Walsh (1996) examined the use of systematic instruction for teaching students with pre-adolescent adolescent students with mental retardation to write their own names. First-name writing skills improved for middle school students with moderate mental retardation using systematic instruction including prompting, praise, and task analysis. Park, Weber, and McLaughlin (2007) employed prompting, fading, and direct instruction techniques to improve the handwriting legibility of two preschool children with physical disabilities. Given these previous findings, it appears that systematic instruction can be beneficial in teaching a variety of student handwriting skills.

The Present Study

The purpose of this study was to increase the legibility of letters using a series of tracing procedures based on the *Handwriting Without Tears*® program (Olsen, 1998). This program is commercially available and can be employed in various classroom settings. These procedures were implemented to teach two preschoolers with disabilities four developmentally appropriate letters. Unlike prior research (McLaughlin & Walsh, 1996; Park et al., 2007), these students already had an understanding of how to write the letters of their names. Therefore, we choose different letters to increase the participants' readiness for later education in

kindergarten or integrated kindergarten. A second purpose was to provide a data-based evaluation of some of the procedures outlined in *Handwriting without Tears*®.

Method

Participants

The participants of the study were two preschool age children with developmental disabilities. Participant 1 was a 4 year 9 month old boy diagnosed with autism. Participant 2 was a 4 year 3 month old girl diagnosed with developmental delays. The two participants were chosen for because neither child could legibly write any letters other than those in their name. Both students could potentially be enrolled in kindergarten for the next school year where they will be expected to learn to write the letters of the alphabet.

The study took place in a self-contained special education preschool classroom located in an elementary school in the Pacific Northwest. Both participants had attended the school for two years. The second participant had been previously attended a birth to three program. Both students attended the school in the afternoon. The number of students enrolled in the class ranged from eight to ten. Data were collected individually at the beginning of the afternoon class period. Each observation session lasted up to 15 minutes within a one-to-one instructional context. Due to high rates of non-compliance, both students were given a gummy bear immediately after completing their worksheets.

Instruments

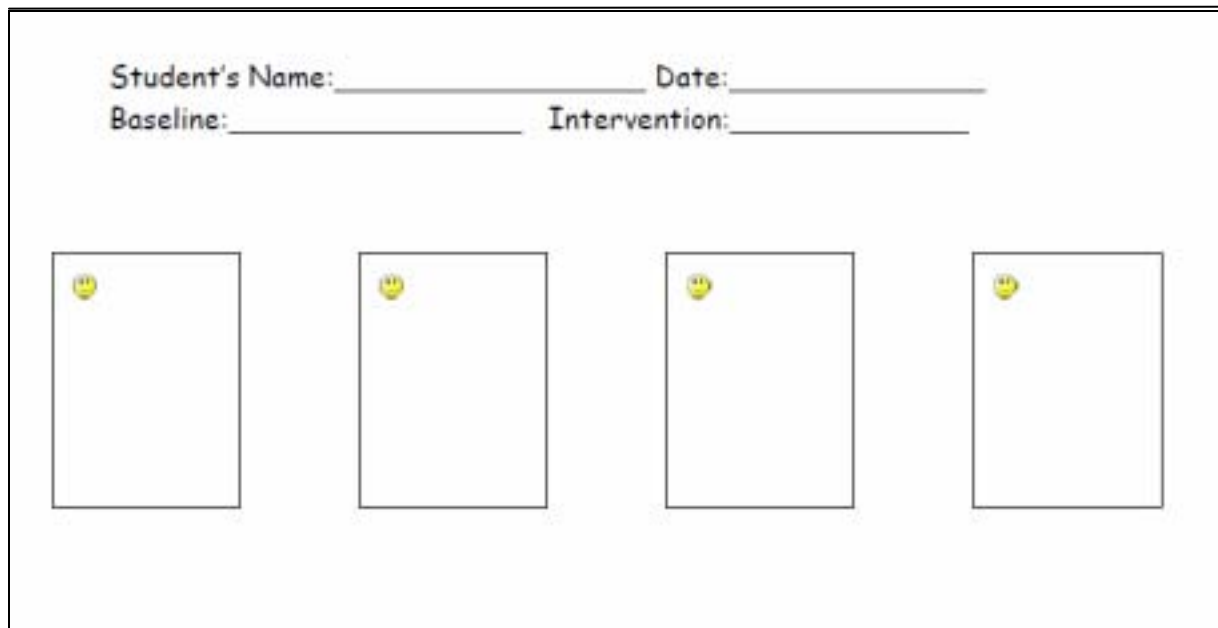
The materials used in the study were derived from the *Handwriting Without Tears*® program. A small 3 x 5” chalkboard with a smiley face in the upper left hand corner was employed. Chalk, a small sponge, a cup of water and a piece of paper towel were used to write on the board. Worksheets for each of the letters (T, H, D, F) were used from the “Get Ready For School” *Handwriting Without Tears*® workbook. The students were offered an array of markers to choose from to use for the worksheet. (YES*+)

The dependent variables of the study were the size and legibility of the letters and the letters staying within the outlined model. For the variable of size, a letter was given a point if it covered at least 80% of the box. The letter was not given a point if the letter covered less than 80% of the box. For the variable of legibility, a letter was given a point if the letter could be identified as a capital letter (lower case letters were not counted as legible). No points were awarded for letters that were illegible. For the variable of whether the letter stayed within the outlined model, a point was awarded if, when compared to model, the letter stayed within the lines with at least 80% accuracy. No point was awarded if the letter did not stay within the outlined model with at least 80% accuracy. Data were collected four days a week for approximately six weeks.

Procedure and Data Analysis

A multiple baseline design (Kazdin, 1982) across letters and participants was used.

A description of the various intervention procedures was as follows. Both participants were given a piece of paper with four boxes on it (See Figure 1). They were given the directions, “Write T”, and after the completion of that letter, the same directions were repeated for the three other letters (H, D, F). Three baseline sessions were carried out for participant 1. Participant 2 completed two baseline sessions.



The worksheet is enclosed in a rectangular border. At the top, there are two lines of text for identification: "Student's Name: _____" followed by "Date: _____". Below these are two more lines: "Baseline: _____" followed by "Intervention: _____". In the center of the page, there are four identical rectangular boxes arranged horizontally. Each box contains a small yellow smiley face icon in its top-left corner, serving as a guide for letter placement.

Figure 1. Worksheet for children.

Handwriting Without Tears® chalkboard and worksheet and highlighted letter with star (intervention 1). After baseline, each participant was given a blackboard and the instructor would state, “We’re going to write the letter ____”. The researcher drew the specified letter with chalk while stating the *Handwriting Without Tears®* steps for formation. For letter T, the instructor stated, “Start at the smiley face, little line across, frog jump, big line down,” for letter H, “Start at the smiley face, big line down, frog jump to the top, big line down, frog jump, little line across,” for letter D, “Start at the smiley face, big line down, frog jump, curved line down,” and for letter F, “Start at the smiley face, big line down, frog jump, little line across, frog jump, little line across.” The participants then used a small wet sponge to trace the specified letter. Next they repeated the same procedure with a paper towel and then with chalk. The participants were provided a *Handwriting Without Tears®* (Olsen, 1998) worksheet for that specified letter. Upon the completion of the worksheet, the participants were presented with the same sheet of paper as used in baseline 1, however, the letter worked on for that day was highlighted with a smiley face in the upper left corner of the box. Once a participant received at least two points for the target letter for at least two consecutive sessions, they were able to move to the next letter.

Handwriting Without Tears® chalkboard and start (intervention 3). The participants completed the chalkboard procedure and the *Handwriting Without Tears* worksheet for the specified letter. However, when given the sheet of paper from baseline, the specified letter was not written in the box, but a model of the letter was presented with in the instruction, “Write letter ____”. A smiley face was present at the upper left corner of the box.

Handwriting Without Tears® chalkboard and start (intervention 3). The participants completed the chalkboard procedure for the specified letter. When the piece of paper from baseline was presented, only a smiley face was present in the box in the upper left corner. The participants were given the instruction, “Write letter ____”.

Handwriting Without Tears® chalkboard and independent (intervention 4). The participants completed the chalkboard procedure for the specified letter. When the piece of paper from baseline was presented, only a box was given in which to write the specified letter. The participants were given the instructions, “Write letter ____”.

Results

Another university student trained in data collection and analysis as well as using the handwriting procedures conducted interobserver agreement. Letters were rescored based on the same three criteria as used by the first author. Interobserver agreement was conducted for all sessions for each participant. Interobserver agreement was calculated by dividing the number of agreements by the sum of the agreements and disagreements and multiplying by 100. The mean agreement for participant 1 was 98.2% and 99.1% for participant 2. Integrity data, as to the appropriate use of the *Hand writing without Tears*® program, was carried out by the regular classroom teacher and the University supervisor. Agreement was 100% for the correct implementation of the program.

Overall, the results indicate that through the implementation of the *Handwriting Without Tears*® procedures, the quality of letters increased for each participant (See Figures 2 and 3). For baseline, participant 1 had a mean score of 1 for letter T, 0.5 for letter H, 0.2 for letter D, and 0.0 for letter F. For intervention 1, participant 1 increased his performance. He had an average score of 3.0 for letter T, 3.0 for letter H, 3.0 for the letter F. During intervention 2, the first participant had a mean score of 3.0 for letter T, 3.0 for letter H, and 2.5 for letter D. For intervention 3, participant 1 had a mean score of 3.0 for letter T and 3.0 for letter H. For intervention 4, participant 1 had a mean score of 3.0 for letter T.

Participant 2 had a mean score of 0.0 for letter T, 0.0 for letter H, 0.0 for letter D, and 0.1 for letter F for baseline. For intervention 1, participant 2 improved and had a mean score of 3.0 for letter T, 2.7 for letter H and 3.0 for letter D. For intervention 2, participant 2 had a mean score of 2.3 for letter T and 2.0 for letter H. For intervention 3, participant 2 had a mean score of 3.0 for letter T. Data were not longer gathered due to the conclusion of the first author's student teaching.

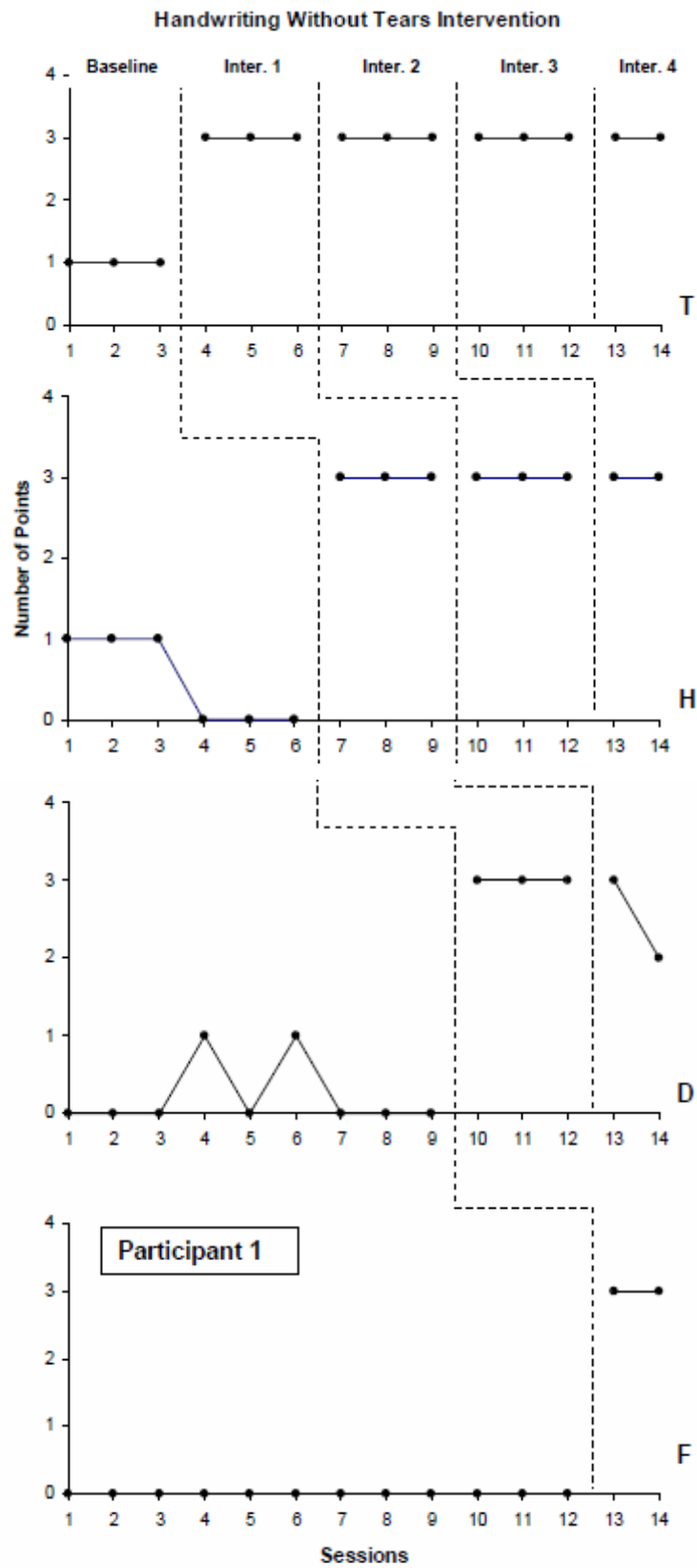


Figure 2. Handwriting without Tears Intervention

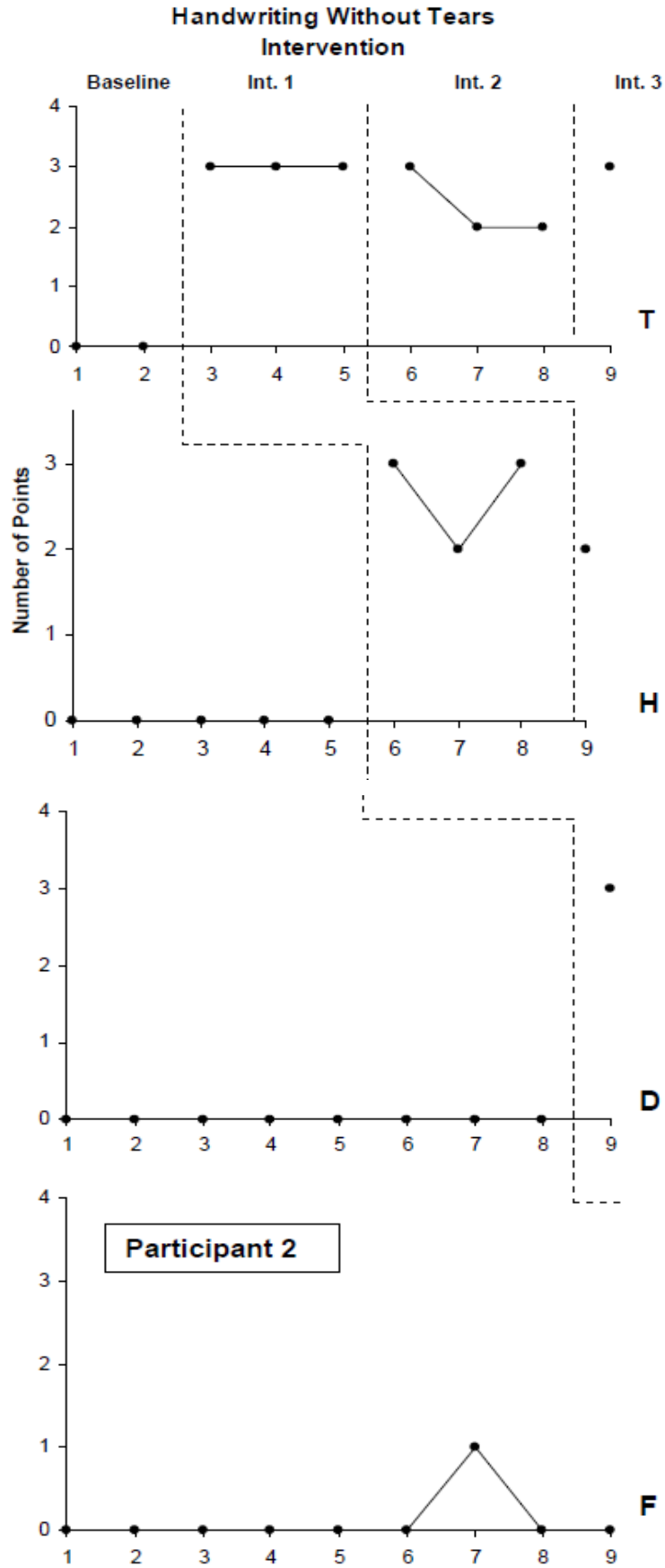


Figure 3. Handwriting without Tears Intervention

Discussion

Overall, the results of this study indicate that the use of the *Handwriting Without Tears*® chalkboard and worksheet along with highlight, model and start point procedures increased the participants' ability to write the letters used in this study. The use of systematic instruction found in *Handwriting without Tears*® replicates prior research (McLaughlin et al., 1987; McLaughlin & Walsh, 1996) with students with disabilities. Specifically, the use of tracing and start points also replicates our recent research with preschool students with disabilities (Park et al., 2007). The research followed the guidelines for handwriting instruction outlined by Graham and Harris (2002). We employed specific practice, we set aside part of the school day for instruction in handwriting, used of cues to guide letter formation, and we employed frequent distributed practice and review.

Strengths of the study were the participants were able to work on letters that were developmentally appropriate and increase the number of letters they were able to identify. The participants also became familiar with the *Handwriting Without Tears*® format, which they may encounter later in their education. Another strength was the procedures can be carried out in the classroom with minimal time and cost for supplies. In addition, once they supplies have been obtained; they can be used for all of the students in a classroom.

To our knowledge, this research provides the first data-based study examining the use of *Handwriting without Tears*®. This curriculum has been advocated for students with disabilities, especially by the occupational therapists. From these data, we provided school personnel with some preliminary data regarding the effectiveness of certain components of the *Handwriting without Tears*® program.

Limitations of the study include the length of time the study was conducted for participant 2. Due to illness, she missed a number of class periods so she was not able to complete as many sessions as Isaiah. If Participant 2 had completed more sessions, this may have well shown that all phases of the intervention proved successful. The instructor could also have included more students in the study. Another weakness of the study was that the participants had to meet all three criteria (size, legibility and whether the letter fit within the outlined model) to receive full credit for a letter. The most common way a point was missed was due to the letter not being large enough. However, the letter could still legible and fit within the

model. If future studies were completed, the size of the box could be decreased to avoid this problem. Finally, gathering data on the generalization of skills with the handwriting without Tears program would appear to be a next logical step.

References

- Ainscow, M. (2005). Understanding the development of inclusive Education system. *Electronic Journal of Research in Educational Psychology*, n. 7, 3(3), 5-20
- Alberto, P. A., & Troutman, A. C. (2006). *Applied behavior analysis for teachers* (7th ed.). Upper Saddle River, NJ: Pearson Education Inc.
- Case-Smith, J. (2002). Effectiveness of school-based occupational therapy intervention on handwriting. *American Journal of Occupational Therapy*, 56, 17–25.
- Cipani, E. & Spooner, F. (Eds.) (1994). *Curricular and instructional approaches for persons with severe handicaps*. Boston: Allyn & Bacon.
- Feder, K., Majnemer, A. & Synnes, A. (2000). Handwriting: Current trends in occupational therapy practice. *Canadian Journal of Occupational Therapy*, 67, 197–204.
- Graham, S. (1999). Handwriting and spelling instruction for students with learning disabilities: A review. *Learning Disability Quarterly*, 22, 78-98.
- Graham, S, Harris, K., (2002). Prevention and intervention for struggling writers. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for academic and behavior problems II: Preventive and remediation techniques* (pp. 589-610). Washington DC: National Association of School Psychologists.
- Graham, S, Harris, K., & Fink, B. (2000). Extra handwriting instruction: Prevent writing difficulties right from the start. *Teaching Exceptional Children*, 33(2), 88-91.
- Hopkins, B. L., Schutte, R. C., & Garton, K. L. (1971). The effects of access to a playroom on the rate and quality of printing and writing of first and second-grade students. *Journal of Applied Behavior Analysis*, 4, 77-88.
- Kazdin, A. E. (1982). *Single case research designs: Methods for clinical and applied settings*. New York: Oxford University Press.
- McLaughlin, T. F. (1981). An analysis of token reinforcement: A control group comparison with special education youth employing measures of clinical significance. *Child Behavior Therapy*, 3, 43-51.
- McLaughlin, T. F., Mabee, W. S. , Reiter, S., & Byram, B. (1991). An analysis and replication of the add-a-word program with mildly handicapped middle school students. *Journal of Behavioral Education*, 1, 413-426.

- McLaughlin, T. F. & Walsh, A. L. (1996). Training pre-adolescent and adolescent students with moderate mental retardation name writing skills. *Journal of Developmental and Physical Disabilities*, 8, 105-115.
- Olsen, J. Z. (1998). *Handwriting without tears* (Workbook). Brookfield, IL: Fred Sammons, Inc.
- Park, C., Weber, K. P., & McLaughlin, T. F. (2007). Effects of fading, modeling, prompting, and direct instruction on letter legibility for two preschool students with physical disabilities. *Child & Family Behavior Therapy*, 29(3), 13-21.