



Handwriting Without Tears®

Original Research Supporting Handwriting Without Tears®

Owens, L.L. (2004) *The Effects of the Handwriting Without Tears Program on the Handwriting of Students in Inclusion Classrooms.* Master's Thesis. Virginia Commonwealth University, Richmond, Virginia.

Two experimental classes received instruction with the Handwriting Without Tears® method while two comparison classes received instruction using traditional methods. Handwriting performance was measured using the Minnesota Handwriting Assessment. The Minnesota Handwriting Assessment (MHA) consists of five categories including: legibility, letter formation, alignment, size, and spacing. MHA scores were analyzed for eighty 2nd grade students in inclusion classrooms during a 10 week study period. Students in the experimental classes showed statistically significant improvement in the areas of size ($p=.008$) and spacing ($p=.014$) compared to the classes receiving the traditional handwriting instruction. Additionally, students who received the HWT instruction had higher mean MHA posttest scores than students who did not receive the HWT instruction. Teachers who used the HWT method during this study were overwhelmingly satisfied with the programs' effectiveness and usability and they continued to use the HWT program after the study was completed.

Pontello, K. M. (1999) *The effectiveness of a structured handwriting program.* Unpublished Master's Thesis. Lakehead University, Ontario, Canada.

Pontello assessed the effectiveness of the HWT program with grade one students using a multiple group time series design with a pretest. The subjects were students in three grade one classes at two elementary schools in Ontario. The Minnesota Handwriting Assessment was used for baseline and subsequent measurements. Two experimental groups received instruction using the HWT program and another control group was instructed using the "ball and stick" method. This study found that the experimental groups improved significantly ($p < 0.001$) in handwriting skills, especially in the area of alignment and sizing. Girls in both experimental groups demonstrated more improvement in overall printing, alignment, and size, whereas boys in experimental groups had more improvement in the areas of legibility and spacing. Improvement in the handwriting of students in experimental groups indicate that a multi-sensory structured handwriting program, particularly Handwriting Without Tears®, may be more effective in improving handwriting legibility than a traditional ball and stick method of instruction.

Guy, Jodie M. (2003) *Effect of proprioceptive input combined with "Handwriting Without Tears" on the handwriting of children with learning disabilities.* Master's Thesis. Western Michigan University.

The purpose of this study was to investigate the effectiveness of "Handwriting Without Tears" on students' handwriting, and to explore if providing proprioceptive input before implementing "Handwriting Without Tears" has an effect on the legibility and accuracy of handwriting. Three first-grade and three second-grade students who received direct occupational therapy services were divided into two treatment groups. Those students in treatment group A received a combination of proprioceptive input and the "Handwriting Without Tears" program during their treatment session. Those students in treatment group B received only the "Handwriting Without Tears" program. Each student completed the Minnesota Handwriting Test (MHT) before and after the intervention period. Handwriting samples were analyzed to show any changes that may have occurred on a per treatment basis. The visual analysis of both the "Handwriting Without Tears" and the MHT suggest that the combination of proprioceptive input and "Handwriting Without Tears" may be more effective when treating the handwriting of elementary-aged students. Both treatment groups showed improvement on the six different scores of the MHT. These results suggest that with or without proprioceptive input, the "Handwriting Without Tears" program does affect handwriting in a positive way.



Handwriting Without Tears®

Research Supporting the Handwriting Without Tears® Method

Six questions educators should ask before choosing a handwriting program. *ERIC Digest* [ED 409 589]. No author available. (1997).

"Educational researchers who tested the legibility of slanted manuscript found that children writing vertical manuscript performed significantly better than those writing slanted manuscript."

"Vertical manuscript letterforms are more easily read than other styles of writing."

"Modified italic letterforms are not consistent with the letters used in reading and spelling books; therefore children [using D'Nealian manuscript] must learn to write using one set of symbols and to read and spell using a different set of symbols."

"It is logical to teach children to write letters that are similar to the letters they are learning to read."

"Before starting school, many children learn how to write traditional [vertical] manuscript letters from their parents or preschool teachers. Learning a special alphabet such as [slanted] means that these children will have to relearn many of the letters they can already write. The vertical manuscript alphabet is easy to teach because there is no reteaching involved. Children are already familiar with vertical letterforms—they have learned them at home."

"Proponents of modified italic letterforms say that initial instruction in their alphabets will facilitate the transition from manuscript to cursive writing, but there is no research available to support this claim."

Addy, Lois M. (1996). A perceptuo-motor approach to handwriting. *British Journal of Occupational Therapy*, 59, 427-432.

"The value of copying and tracing must also be raised: while children are tracing and copying, it is difficult to see whether their letters are being formed correctly. They may be consolidating incorrect directional habits which may be difficult to correct (Clay, 1975; Sassoon, 1989). Copying and tracing . . . are only useful when children have firmly established movement patterns (Martin et al, 1989; Martlew, 1994) . . . It is therefore imperative that children are not expected to write functionally more than is appropriate to their development."

"There can be agreement that handwriting needs to be taught appropriately and consistently from an early age. It can be enhanced through developing specific perceptual and motor skills appropriate to the requirements of handwriting. Any innovation being considered must, first, acknowledge the child's understanding of literacy."

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

"As the third-grade students had been in the habit of printing with vertical strokes, the change in slant [with cursive] plus the additional factor of learning new letter forms could have caused a lack of uniformity of slant between writing samples. Hence, it is possible that initial teaching of cursive writing should include vertical letter formation with a change to slant after letter forms have been mastered."

Berninger, V.W., Graham, S., & Weintraub, N. (1998). The relationship between handwriting style and speed and legibility. *The Journal of Educational Research*, *91*, 290-296.

"Slanted manuscript letters are no more successful than traditional manuscript letters in enhancing the transition to cursive writing or in improving the overall legibility of students' manuscript writing."

Case-Smith, J. (2002). Effectiveness of school-based occupational therapy intervention on handwriting. *American Journal of Occupational Therapy*, *56*, (1), 17-25.

"Olsen has written a handwriting curriculum that uses a developmental approach, grouping the letters by difficulty and teaching a handwriting style that uses simple, vertical lines."

Clark-Wentz, J. (1997, October). Improving students' handwriting. *OT Practice*, 29-33.

"In the Handwriting Without Tears system, creator Jan Olsen, OTR, uses only two writing lines—a baseline and a center line—which is visually less confusing than the typical school handwriting paper. This is especially helpful for students who have visual figure-ground deficits. The program encompasses techniques for prewriting through cursive skills."

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

"The Zaner-Bloser manuscript style may also be inappropriate for some beginning writers . . . students with poor visual memory would find it difficult to write the letter forms."

Ediger, M., (2002). Assessing handwriting achievement. *Reading Improvement*, *39*, 103-111.

"Teachers in the school setting need to emphasize quality handwriting across the curriculum. Quality handwriting means that the written content is easy to read in either manuscript or cursive form."

Edwards, L. (2003). Writing instruction in kindergarten: examining an emerging area of research for children with writing and reading difficulties. *Journal of Learning Disabilities*, *36*, 136. Retrieved August 20, 2004 from Aladdin database.

"To write a letter, a child must attach a verbal label (name) to a letter form; have an accurate, precise representation of the letter form in memory; and be able to access that letter in memory and retrieve it."

"Based on the limited research available on writing instruction in kindergarten classrooms for children with reading and writing difficulties, what should writing instruction in kindergarten classrooms look like? Although empirical results should certainly guide instructional practices, the following considerations based on the literature highlighted in this review can be offered. Whether writing instruction is distributed throughout the kindergarten day or whether it is incorporated into a single daily intervention (e.g., Edwards et al., 2002), writing in kindergarten can include instructional components related to handwriting, letter writing accuracy and fluency, spelling, and perhaps simple compositions."

"Although further research is required, handwriting and spelling instruction in kindergarten for children with writing and reading difficulties may help students develop more fluent transcription skills (and, it is hoped writing abilities) in later grades. Furthermore, learning how to write letters and spell words appears to reinforce the letter naming, phonemic, and word reading skills emphasized in kindergarten classrooms (Berninger et al., 1997; O'Connor & Jenkins, 1995) When considering the importance of quality interventions for children with possible early writing and reading difficulties, it appears that the strategies and explicit use of writing in kindergarten may serve as a powerful instructional component with a potentially intrinsic motivating benefit."

Einhorn, K. (1999). Handwriting success for all. *Instructor*, *110*, 35-39.

"Explicitly teaching letter formation to the whole group takes a short time; children can then work independently or practice at the writing center as you focus on other areas of the curriculum When guiding children's letter-formation practice, consistency and legibility are the goals. Do children make the same letters the same way each time? Are all the tall letters tall, and the small letters small?"

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

"According to Hoskisson and Tompkins (1987), handwriting is best taught in separate periods of direct instruction and teacher supervised practice. As soon as skills are taught, they are applied in real-life writing activities."

"Effective handwriting programs provide opportunities for children to verbalize the rules of letter formation and to combine verbal and visual feedback with rewriting and reinforcement" (Furner, 1985, Koenke, 1986).

"Two things are critical in the handwriting teaching strategies: (1) that children be taught handwriting and (2) that they practice the handwriting skills taught" (Ellis, Standal, Pennau, & Rummel, 1989).

Graham, S., Harris, K.R., & Fink, B. (2000). Is handwriting casually related to learning to write? Treatment of handwriting problems in beginning writers. *Journal of Educational Psychology, 92, 620-633.*

"Supplemental handwriting instruction had a more pronounced effect on all measures of handwriting performance (handwriting, letter knowledge, writing, attitudes toward writing) than did instruction in phonological awareness."

"Students benefit from explicit and supplemental instruction in how to form and fluently write the letters of the alphabet, as they evidenced improvement in both their handwriting and compositional skills. Thus if educators want to improve the writing of students, they need to focus not just on the content and process of writing, but on transcription skills such as handwriting as well."

"In recent years, there has been a tendency to downplay or even eliminate handwriting instruction as part of the writing program (Berninger, 1999; Graham & Weintraub, 1996), as approaches such as whole language and process writing have placed greater emphasis on content and process and much less emphasis on form. The findings from the current study as well as the investigations by Berninger et al. (1997) and Jones and Christensen (1999), however, indicate such an approach may be ill-advised with beginning writers who experience difficulty in initially mastering the intricacies of handwriting."

Graham, S., Harris, K.R., & Fink, B. (2000). Extra handwriting instruction: prevent writing difficulties right from the start. *Teaching Exceptional Children, 33, 88-32.*

"Children who experience difficulty mastering this skill may avoid writing and develop a mind set that they cannot write, leading to arrested writing development."

Graham, S. (1993/94). Are slanted manuscript alphabets superior to the traditional manuscript alphabet? *Childhood Education, 71, 91-95.*

According to a study by Farris (1982), "Overall, students who had been taught traditional manuscript produced more legible cursive writing than students in the D'Nealian group. Students in the D'Nealian group were more likely to misshape cursive letters, extend strokes above and below the guidelines and vary the size of letters. Consequently, in the study the production of cursive writing was not enhanced by D'Nealian instruction."

"It is possible that slanted manuscript alphabets did not lead to superior cursive writing because they do not facilitate the transition to cursive to the extent claimed."

"In an analysis of the D'Nealian and McDougal, Littell handwriting programs (Graham, 1992), the author found that almost half (46 percent) of the cursive letters in each program are substantially different from their manuscript counterparts. An additional 21 percent of the cursive letters in D'Nealian and 26 percent of those in the McDougal, Littell program involve small changes in letter formation . . . in order to add a connecting stroke Learning cursive writing in these programs is not a simple transition."

Graham, S. (1993/94). Are slanted manuscript alphabets superior to the traditional manuscript alphabet? *Childhood Education, 71, 91-95. (cont'd)*

"In summary, the available evidence failed to substantiate the claim that the transition to cursive writing is enhanced by using a slanted manuscript alphabet."

"A slanted manuscript alphabet may not be the best choice for young children for several reasons. First, there is no credible evidence that these alphabets make a difference in children's handwriting. Making the transition to cursive writing does not appear to be enhanced by using a special alphabet like D'Nealian Second, the use of slanted manuscript alphabets creates several practical problems for teachers Learning a special alphabet like D'Nealian means that many children would have to relearn letters they can already write."

"Given the lack of supportive evidence and the practical problems involved in implementation, slanted manuscript letters cannot be recommended as a replacement for the traditional manuscript alphabet."

Graham, S. (1992). Issues in handwriting instruction. *Focus on Exceptional Children, 25 (2), 1-15.*

"There is no credible evidence that the new, slanted manuscript alphabets make a difference for students in general or for special needs students in particular. The transition to cursive writing does not appear to be enhanced by a special alphabet like D'Nealian."

"The writers of the slanted alphabet tended to make more misshapen letterforms, tended to extend their strokes above and below the guidelines, and had a difficult time keeping their letterforms consistent in size."

Hackney, C., (1996). Organizing for handwriting instruction. *Teaching Pre K - 8, 27, Retrieved August 20, 2004 from Aladdin database.*

"Handwriting deserves its rightful place in the curriculum. No teacher is too busy to devote fifteen minutes a day to teaching and maintaining the keys to legible handwriting. I assure you that it will pay off."

Keller, M. (2001). Handwriting club: using sensory integration strategies to improve handwriting. *Intervention in School and Clinic, 37, 9-13.*

"Handwriting is a complex skill that is not often taught directly. It is not unusual for some students with disabilities to have difficulty with handwriting Handwriting was a subject that I didn't believe I had time to teach. As a teacher of students with behavior disorders and learning disabilities, I felt more responsible for teaching basic skills. I did not have time to "do" handwriting I now realize that handwriting is a more important skill than I previously believed."

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

"Regardless of the program, copying leads to better results than just tracing or discrimination training (which helps one to read a letter more than to write it)."

Koenke, K. (1986, November). Handwriting instruction: what do we know? *The Reading Teacher, 214-216. (cont'd)*

"What appears to be important in the development of handwriting is the amount of emphasis teachers place on legible, neat writing, and also the presence in the classroom of good handwriting models" (Milone & Wasyluk, 1981).

Lamme, L. (1979). Handwriting in an early childhood curriculum, *35 (1), 20-27.*

"It is best to use a standard form of manuscript printing initially to teach children to write alphabet letters. The importance of adult modeling of proper letter formation cannot be overemphasized."

Malloy-Miller, T. Polatajko, H., & Anstett, B. (1995). Handwriting error patterns of children with mild motor difficulties. *Canadian Occupational Therapy Journal*, 62, 258-267.

"Illegible handwriting is found to have secondary effects on school achievement and self-esteem."

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

"Research on whether teachers should encourage children to copy or trace during handwriting practice has reached general agreement that copying is preferable to tracing for initial handwriting instruction" (Burkhalter & Wright, 1984; Hirsch & Niedermeyer, 1973).

"The study (Hayes, 1982) concluded that copying can be enhanced by providing perceptual prompts, such as visual and verbal cues, resulting in significantly increased accuracy in reproducing letter forms."

Ross, E. (1990). *Introduction to teaching the language arts, 1st edition*. California: Wadsworth Publishing.

"When planning instruction, they [curriculum decision makers] should keep in mind the objectives of a good handwriting program: to help students (1) develop neat and legible handwriting for purposes of communication, (2) acquire facility in both manuscript and cursive writing so that writers may use either style, (3) gain speed and proficiency in writing, and (4) see the value of good handwriting."

"A study by LaNunziata and others (1985) showed that kindergarten children improved most in producing accurate letters when teachers modeled correct letter formation."

Sheffield, B. (1996). Handwriting: a neglected cornerstone of literacy. *Annals of Dyslexia*, 46.

"Automatic legible writing is an essential basis for written expression. And yet, crowded school curriculum and neglect by educational institutions and researchers often leave no room for appropriate and sufficient attention to teaching this critical skill."

"Because kinesthetic learning is such a strong learning channel and so reliable, all children need to assimilate accurate formation of alphabet letters to a point that forming these letters requires no conscious effort."

Smith- Zuzovsky, N., & Exner, C.E. (2004). The effect of seated positioning quality on typical 6- and 7-year-old children's object manipulation skills. *American Journal of Occupational Therapy*, 58, 380-388.

"Emerging in-hand manipulation skills may be more affected by the quality of seated positioning than skills that have been mastered."

"Such findings raise concern that a child may perform more poorly on a test involving hand skills or hand use [such as performing handwriting demands] if seated in furniture that does not provide appropriate support."

"The key findings of this study suggest the importance of including positioning instructions in test manuals and the need for professionals to consider the furniture a young child uses when testing his or her fine motor abilities and other skills measured by activities involving hand use."

Ste-Marie, D.M., Clark, S. E., Findlay, L.C., & Latimer, A. E. (2004). High levels of contextual interference enhance handwriting skill acquisition. *Journal of Motor Behavior*, 36, 115-27.

"Our findings suggest that approach is ill-directed and that students do in fact need explicit instruction on how to form and fluently write letters. The underlying reason for this recommendation is that fluency in handwriting has been linked to other educational skills such as compositions (Berninger et al., 1997; Graham et al., 2000) and other written expression (Jones & Christensen, 1999). Thus, early handwriting instruction could avoid cognitive or affective difficulties, or both, that may be encountered by children with inadequate handwriting skills."

Tseng, M. H. & Cermak, S. (1993). The influence of ergonomic factors and perceptual-motor abilities on handwriting performance. *American Journal of Occupational Therapy, 47, 919-926.*

"If the teachers understand the child's difficulty, they will not attribute poor handwriting to laziness and they will realize that when the child puts a lot of effort into the graphomotor aspects of writing, his or her ability to process the content of the information may be compromised."

"The goal of the [direct] treatment is for the child's writing to become automatic and fluid so that he child does not have to think about letter formation and can produce an adequate volume of work in an expected period of time without undue fatigue. Remediation of handwriting should always be done in conjunction with the child's teacher so that a consistent approach to teaching handwriting is used. Practice with letter formation is certainly a necessary component of remediation. In addition, the child's motor skills and sensory processing abilities that contributes to and are considered to underlie good handwriting are important to consider."

Tseng, M. H. & Murray, E. (1994). Differences in perceptual motor measures in children with good and poor handwriting. *Occupational Therapy Journal of Research, 14, 19-36.*

"This [study] suggests that clinicians assisting children who have handwriting problems may wish to assess motor planning ability as part of their evaluation."

Viadero, D. (2002). Studies back lessons in writing, spelling. *Education Week, 22, Retrieved August 20, 2004 from Aladdin database.*

"A small but growing number of studies suggest that systematically teaching handwriting and spelling might actually help some students write more and do it better. Students who have good handwriting and sound spelling skills are able to write better prose."

Viadero, D. (2001). Penmanship problems hurt quality of student writing, study suggests. *Education Week, 20, Retrieved August 20, 2004 from Aladdin database.*

" . . . suggests that a little handwriting instruction can go a long way in staving off writing problems. While improved handwriting won't necessarily improve creativity, it can result in more grammatical, fluid sentence structure."

Viadero, D. (1993, November/December). A new slant on penmanship. *Teacher Magazine, 20-21.*

"There are good reasons for teaching children to write with traditional vertical, rather than slanted, strokes. In all books, on environmental signs, on children's TV programs, the letters are all vertical When children come to school, they are already familiar with that alphabet, or they may already be writing it."



Handwriting Without Tears®

Readiness Research

Research supporting HWT's reasoning for unique multi-sensory teaching concepts and hands-on manipulatives.

Handwriting Without Tears® multi-sensory teaching methods (modalities) and hands-on manipulatives complement all learning styles of children (visual, auditory, tactile, and kinesthetic). Research shows that achievement is significantly increased with multi-sensory instruction.

According to Farquharson and Carithers (2004) information about learning styles is important for everyone—students, instructors, and educational leaders in higher education need to know as much as possible about the learning processes, particularly how individuals learn. This will help them immensely in both the design and implementation of teaching that *enhances* learning.

There are four major channels of learning:

Visual: Visual learners learn through seeing. They prefer to look at illustrations, or watch others doing something, rather than listening.

Auditory: Auditory learners prefer to listen. They are usually able to memorize what they hear and tend to be very attentive when information is presented in this fashion.

Tactile: Tactile learners like to incorporate their fine motor skills. They like to keep their hands busy.

Kinesthetic: Kinesthetic learners need to use their bodies in the learning process. They need to “do”. They are hands-on learners.

Reference:

Carithers, B. & Farquharson, F. (2004). *Learning Styles*. Orlando, FL: Valencia Community College. Retrieved March 2004 from the World Wide Web: http://faculty.valencia.cc.fl.us/ffarquharson/learning_styles/

Research concerned with identifying the relationship(s) between academic achievement and individual learning style has provided consistent support for the following:

- a) students do learn differently from each other;
- b) student performance in different subject areas is related to how individuals do, in fact, learn;
- c) when students are taught with approaches and resources that complement their unique learning styles, their achievement is significantly increased

* (DeBello, 1985; Dunn, DellaValle, Dunn, Geisert, Sinatra, & Zenhausern, 1986; Dunn, Dunn, Primavera, Sinatra, & Virostko, 1987; Dunn, Krimsky, Murray and Quinn, 1985; Dunn, Cavanaugh, and Zenhausern, 1982; Giannitti, 1988; Hill, 1987; White, 1981; Hodges, 1985; Jarsonbeck, 1984; Kroon, 1985; Lemmon, 1985; Lynch, 1981; MacMurren, 1985; Martini, 1986; Miles, 1987; Murrain, 1983; Pizzo, 1981; Shea, 1983; and Spires, 1983).

In addition to the research documentation substantiating the positive effects that occur when students are taught in ways that are responsive to how they each learn, widespread practitioner corroboration has been published based on classroom or school wide experiences.

* (Ballinger & Ballinger, 1982; Carruthers & Young, 1980; Cavanaugh, 1981; Dunn, 1981; Fiske, 1981; Dunn & Griggs, 1987, 1989a, 1989b; Gardiner, 1983; Hodges, 1982, 1983; Jenkins, 1982, 1986; Lemmon, 1982, 1985; Pizzo, 1982; Vigna & Martin, 1982; and Wheeler, 1980).

Reference:

learningstyles.com (2004). *Achievement Gains Through Learning Styles Matching*. Retrieved March 2004 from the World Wide Web: http://www.learningstyle.com/research_main.html

According to Hood (1995), in 1992 an individual by the last name of Reiff explained that an effective means to reach all learners is modality-based (multi-sensory) instruction, which consists of organizing around the different modalities to accommodate the needs of the learner. Modality based instruction consists of a variety of motivating, introductory techniques and then providing alternative strategies when a student fails to grasp a skill or concept. If a learner does not initially understand the lesson, the teacher needs to intervene, personalize instruction and reteach using different methods.

Reference:

Hood, K. (1995). Exploring Learning Styles and Instruction. Athens, GA: University of Georgia. Retrieved from the World Wide Web March 2004 <http://jwilson.coe.uga.edu/EMT705/EMT705.Hood.html>

Research supporting HWT's unique teaching order. Why HWT teaches capital letters before lowercase.

According to Amundson (2000), one study by Tan-Lin (1981) examined the sequential stages of letter acquisition of 110 children between the ages of 3 and 5 years old.

Children were observed copying numbers, letters, a few words, and a sentence three times over a period of 4 months. Her findings revealed the following sequential stages of prewriting and handwriting:

1. controlled scribbles
2. discrete lines, dots or symbols
3. straight-line or circular letters
4. upper-case letters (capitals)
5. lower-case letters

Additionally, Gesell (1993) explained how children gradually develop their ability to copy forms in a very predictable order.

1. vertical line
2. horizontal line
3. circle
4. cross
5. square
6. triangle

The Handwriting Without Tears® curriculum bases its teaching order in pre-k, Kindergarten and 1st Grade on what is developmentally sound for children based on research. In the HWT curriculum a child:

1. Aims and scribbles freely
2. Learns pre-strokes and shapes in a developmental sequence (based on Gessell's research)*
3. Learns capitals
4. Learns lowercase

By teaching in a developmental progression children will develop good consistent habits for size, letter formation and letter placement. Children will master handwriting more quickly and easily as possible because developmental principles are utilized and easy things are placed before difficult things. Handwriting Without Tears® essentially breaks the task of handwriting down into specific development units.

References:

Amundson, S.J. (2000). Prewriting and Handwriting Skills. In J. Case-Smith (Eds.), *Occupational Therapy for Children* (pp. 545-570). Columbus, OH: Mosby.

Gesell, A. (1993). *The First Five Years of Life*. New York: Buccaneer Books.

Tan-Lin, A.S. (1981). An investigation into the developmental course in preschool/kindergarten aged children's handwriting behaviors. *Dissertation Abstracts International*, 42, 4287A.

Research supporting HWT's concepts of teaching young children crayon and pencil grip. Why HWT recommends the use of broken crayons and teaching young children (in preschool, Kindergarten and 1st grade) "how to" hold their tools correctly.

Research shows that close to 50% of three year olds have the fine motor *ability* to hold a small crayon correctly.* What this study tells us, is that children's fingers are ready to hold tools at a young age. When the child reaches a level of fine motor development, they become "ready" to be shown how to hold a crayon or pencil correctly by an adult. By demonstrating and modeling for children we can encourage good handwriting habits early on. Handwriting Without Tears® uses these researched principles to educate teachers and parents on the importance of teaching this skill early on.

Another study by Weiraub (1999), examined the use of an adaptive technique, broken crayons, with four and five year old children with developmental delays. Her study found that such a technique (as recommended by HWT) had a significant influence on expediting the formation of a tripod (mature) grasp more than children who are not provided with broken crayons during coloring activities.

In the HWT curriculum, teachers are educated on these important principles. Teachers are provided specific techniques to teach children in Pre-K, Kindergarten and 1st Grade how to hold their tools effectively so that the skill can be generalized during handwriting. HWT knows that using a writing tool correctly requires instruction. Correct grips need to be taught. Awkward grips just happen. How children hold their crayon, chalk or pencil depends on their developmental stage, the writing tool being used, and the instruction the students receive. Carefully, research-based principles, assures HWT that they are educating teachers on things that will benefit children's handwriting skills for a lifetime.

References:

- *Schneck, C.M., & Henderson, A. (1990). Descriptive analysis of the developmental progression of grip position for pencil and crayon in nondysfunctional children. *American Journal of Occupational Therapy*, 44, 893-900.
- *Tseng, M.H. (1998). Development of pencil grip position in preschool children. *Occupational Therapy Journal of Research*, 19, 207-224.
- *Yakimishyn, J.E. & Magill-Evans, J. (2002). Comparisons among tools, surface orientation, and pencil grasp for children 23 months of age. *American Journal of Occupational Therapy*, 56, 564-572.
- Weinraub, D.L. (1999). *The Effects of the Use of Broken Crayon Upon Grasp Development in Conjunction with Occupational Therapy*. Unpublished master's thesis, Touro College, Far Rockaway, NY.