

The "Write Stuff" For Preventing and Treating Disabilities

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Written language disabilities are extremely prevalent in the population of children with learning disabilities. Reading disabilities might be identified sooner than writing disabilities in many children, but writing disabilities are more persistent. Public concern and public awareness are on the rise. Now that states are expected to be accountable for students learning, and many have instituted a statewide assessment of writing competence, both educators and parents are concerned about the large number of children whose writing skills are below standard. In this educational climate, students with writing disabilities are much more likely to be noticed.

The University of Washington research program on writing disabilities, which has been funded by the National Institute of Child Health and Human Development since 1989, has discovered two kinds of writing disabilities. One group has initial trouble learning to read; the children respond well to instruction, but have persistent problems with writing. One of these children commented to this author, "OK, so now you cured my dyslexia; now what are you going to do about my dysgraphia?" For many other children, writing problems develop even though they learned to read quite easily. Educators or parents may mistakenly attribute specific writing disabilities to lack of motivation or effort. However, appropriate assessment often reveals one of several reasons for writing difficulty:

- a) underdeveloped spelling, handwriting or composing skills, singly or in combination;
- b) processing problems related to handwriting, spelling and composition to included orthographic or phonological coding, fine motor planning, automatic letter retrieval and production, working memory, and so forth; or,
- c) attention deficit disorder. In addition, some children have simply not had a program of coordinated, explicit instruction in all the component skills needed to develop a functional writing system.

The University of Washington research program is being conducted in three phases. In the first phase, we designed a large-scale assessment to validate the components of writing disabilities and the processes that are functionally related to each of these components. This work has provided the conceptual foundation for the Process Assessment for the Learner (PAL) test, which the Psychological Corporation is developing and norming on the same sample as the Wechsler Intelligence Scale for Children and the Wechsler Individual Achievement Test. The PAL diagnostic will be available, along with the WIAT-II, in 2001. It will provide an improved assessment system for conducting research and doing clinical evaluations of writing disabilities.

In the second phase of the research, we focused on early intervention to prevent writing difficulties and long-term intervention to treat serious writing disabilities. A hallmark of this phase of the research is that intervention is aimed at both low-level and high-level cognitive and linguistic skills in the same instructional session to create a functional writing system. For example, whenever handwriting or spelling is taught, children compose in the same instructional session.

When time permits, instruction is aimed at all levels of language in the same instructional session: the subword level (phonological awareness, letter formation and orthographic awareness); the word level (multiple strategies for connecting spoken and written words while spelling); and, text level (constructing sentences and discourse). The guide recently written for parents and educators with these instructional strategies is Process Assessment for the Learner (PAL); Guides for Intervention (Berninger, 1998).

In the third phase, we continue to evaluate instructional interventions. However, we have added projects in our Multidisciplinary Learning Disabilities Center, also funded by NICHD, that a) evaluate the effectiveness of teacher training on student learning outcomes, b) investigate the genetics of subtypes of writing disabilities, and c) image the brains of students with and without writing disabilities. The following is a brief summary of our findings to date.

Handwriting Automaticity

Once children have been introduced to letter formation, they must learn to retrieve and produce letters automatically. Handwriting automaticity, which is assessed by the number of letters written correctly within a brief time limit, is a strong predictor of the quality of composition in normally developing and disabled writers. If letter production is automatic, memory space is freed up for higher level composing processes, such as deciding what to write about, what to say and how to say it. Although many people believe that writing is primarily a motor process, our research supports a different point of view: writing is a written language process. The intactness of fine motor skills alone does not account for handwriting problems as much as the ability to code an identified language symbol (letter) in memory.

To help struggling writers put letter retrieval and production on automatic pilot, we ask them to study a model letter with numbered arrow cues and then to follow those cues as they write the letter. We then ask children to write letters from memory to help them create retrieval routines. We gradually increase the time interval between when the child looks at the letter and when she tries to write it from memory. During each teaching trial, we name the letters at least three times: when children are asked to study the numbered arrow cues, when they are asked to cover each letter and when they are asked to write each letter from memory. In contrast to the practice of asking children to write similar letters over and over, we ask children to study and write all 26 letters of the alphabet in each instructional session. To avoid brain habituation, which is common when tasks do not vary sufficiently, children are usually asked to write each of the 26 letters only once in a practice session. Recycling through the alphabet might be done a second or third time, but never more than that.

Spelling

Spelling is harder to remediate than handwriting automaticity or composition. Our genetic studies have found two abilities that are most likely to be inherited are written spelling and repetition of spoken pseudo-words. When written spelling has improved significantly in children, associated improvement in pseudo-word repetition also has occurred, suggesting that the ability to process the sound structure of spoken words is common to both tasks. Several traditional approaches to word study were not sufficient for improving the spelling of children with learning difficulties, including the method of looking at the word, memorizing the letter sequence, covering the word and writing it from memory. Learning to spell requires linking the spoken word to the written word, not simply visual memorization. The following instructional strategies have resulted in significant gains in the children we study:

1. Children need to understand that the sound structure of words is related to the structure of written words, although not always in a perfect way. Phonological awareness training should be part of spelling instruction. For one-syllable words, children can play games in which they delete or substitute sounds in words. For words with more than one syllable, students can hold up a finger for each syllable and then use colored tokens to represent phonemes in each syllable. In cases in which syllable boundaries in the spoken word vary or are ambiguous, the teacher should tell the students that the relationship between speech and print can be "messy." Students may need to be reminded that the number of phonemes is often not the same as the number of letters, because we use letter groups and patterns to represent sounds.
2. Children need to understand that letters and letter combinations are used to translate units in the spoken word to units in the written word. Functional spelling units are usually one or two letters in size (ph, oa and ng are two-letter functional units; A Talking Letters Pictionary helps

children learn the sound-letter correspondences). Consonant and vowel correspondences are taught separately, organized by the syllable types. Phoneme-spelling correspondences differ in degree of predictability (number of possibilities for the same sound) and children are taught that spelling is predictable even though the correspondences vary. Children who learned the associations for the two-letter spelling units made the most progress learning to spell and recognize words. Two other strategies were helpful: a) saying the names of the letters in the word and then saying the whole word; and, b) pairing the sounds and spellings of the onset of a syllable with the sounds and spellings of the rime part of the syllable (e.g., thr + ill).

3. Children need repeated practice writing specific words to dictation. Exclusive reliance on incidental instruction during the "teachable moment" or use of personal dictionaries with entries for the words most commonly used in compositions is not sufficient for children at risk. A minimum of 24 practice trials, distributed over a two-month period, was needed for at-risk second graders to achieve short-term mastery of spelling specific words.

4. Training also needs to be given for words that contain permissible alternative spelling units for a given sound that depend on a specific word context and for schwa syllables (indistinct, unaccented syllables that need to be memorized because they cannot be sounded out, such as the a's in Philadelphia).

Composition

Self-directed journal writing is ineffective with students who lack skills for text generation. Because planning is difficult for beginning writers in general, and especially so for students with writing problems, many children need guided assistance in the form of prompts. Three kinds of prompts make planning easier: a) composition starters, b) teacher queries such as, "What else can you think of?" and, c) prompts for eliciting one of the 21 self-instruction cues we teach children that will help them generate the next sentence. Graphic organizers for both narratives and exposition are useful to help struggling writers plan what to write. Also helpful is explicit modeling of composition in which the teacher thinks aloud, using a chart or overhead transparency, while planning, generating and revising the text produced.

Children also benefit from being taught specific self-regulations strategies. Two are especially helpful. The first was suggested by Jenifer Katahira, a master teacher who specializes in integrated reading and writing instruction. Students are taught to say, "What I think I can say, what I say I can write." The teacher models this process using sound-keyword-spelling cards (Talking Letters in our program) to translate what I can say into what I can write. The students then apply the strategy on their own. The second strategy is PWRR: plan, write, review, revise, which are steps that are constantly rehearsed and reinforced. All of our composition instruction emphasizes writing for a real audience; therefore, compositions are shared with either the tutor or peers in small groups.

Coordinating the Components of the Functional Writing System

Many component processes need to be coordinated to write a composition, just as many instruments in the orchestra need to be synchronized to produce a symphony. We begin each lesson with a warm-up to practice handwriting and/or spelling. We liken this warm-up to the athlete who stretches before running or the musician who tunes and plays scales before performing. Handwriting and spelling are presented as tools for communicating ideas. Kris Begay, one of our tutors, puts it this way: "Training transcription skills is like giving an artist a box of paints; he needs the tools for creative work." We then focus on planning, generating, reviewing, and revising text. Our children have improved significantly in handwriting, spelling and composition when low-level transcription is transferred seamlessly to high-level composing within the same lessons.

Much work remains to be done to ensure that writing disabilities are appropriately identified, diagnosed and treated. Our work to date suggests that writing disabilities, like reading disabilities,

are to large to extent preventable, although some may require life-long treatment and accommodation.

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