

Research and Conceptual Basis for *WordMaker*[®]

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Abstract: This document presents the conceptual and research basis for the *WordMaker* software program that provides individual instruction in spelling and decoding. The program is based on a unique pattern-detection instructional approach.

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Introduction

Released in 2004, *WordMaker* is a phonics/phonemic awareness/spelling software program developed in collaboration with Dr. Patricia Cunningham, founder and author of the Four-Blocks® Literacy Model. *WordMaker* is based on Dr. Cunningham's book, *Systematic Sequential Phonics They Use*, a manipulative spelling and word study approach in which children actively learn how the alphabet works. The program combines two activities that Dr. Cunningham feels are particularly successful in teaching reading: students manipulate letters to make words, discovering the patterns as they do; and then they sort the words into rhymes and use the rhymes to decode and spell new words. The program models correct pronunciation of letters, sounds and words in clear human speech, and uses letter manipulation to "make" more than 800 words. It is also designed to teach phonics in the most commonly accepted sequence.



According to the National Reading Panel (NRP), the goal in all phonics programs is to “enable learners to acquire sufficient knowledge and use of the alphabetic code so that they can make normal progress in learning to read and comprehend written language”.¹ *WordMaker* meets these criteria by teaching students to:

- Segment spoken words into phonemes in order to spell them correctly
- Manipulate phonemes from spoken words in order to spell new words (e.g., “change one letter in *car* to make *far*”)
- Manipulate and blend onsets with rimes during sorting and transfer activities
- Manipulate letters to spell words as the students segment the words into phonemes

Stahl, Duffy-Hester and Stahl² suggested that the most effective phonics instruction is planned and sequential, explicit and systematic. *WordMaker* meets all of those criteria. The phonics instruction in *WordMaker* is a planned sequence of phonics and spelling lessons with specific letters, sounds and words. Students begin by learning phonemic awareness, letter names and sounds. They progress to learning digraphs, blends and vowel patterns in one- and two-syllable words. They continue to progress to decode and spell polysyllabic words.

Program Design

WordMaker's 140 lessons correspond directly to lessons in the *Systematic Sequential Phonics They Use*, and are divided into 5-lesson units. Each lesson takes about 10 minutes to complete. During the lessons (Figure 1) students manipulate letters to make and sort words, sort words by either beginning sound or by ending rime, and practice word recognition. Students hear auditory prompts to make a word, then drag letters to blanks, and click an onscreen checkmark to receive feedback. When working with the pictures or the words, students can place the cursor over each item to have it pronounced as many times as needed.

Figure 1



Students also view “word walls” of the words they have mastered (Figure 2). At all levels of the program, children are explicitly taught letter-sound relationships and how these relationships transfer to decoding and spelling unfamiliar words.

Each lesson has three parts. First, children manipulate letters to make words. Each lesson begins with short easy words, and then progresses to longer, more complex words. The last word is always the “secret word” — a word that can be made with all the letters introduced in that lesson. This spelling-based approach helps children learn letter sounds, and how to segment words and blend letters, and it also helps them develop phonemic awareness as they “stretch out” words and listen for the sounds they hear and the order of the sounds.

Figure 2



Phonemic Awareness

Through these lessons, *WordMaker* reinforces phonemic awareness, or the ability to mentally discern and manipulate sounds in words. The program helps children identify rhymes, segment words into sounds and blend sounds back together to form words. Because these activities teach children to hear the phonemes in words, use letters and have children add, delete and replace letters to spell different words, they also teach phonemic awareness in a way that is consistent with conclusions of the National Reading Panel:

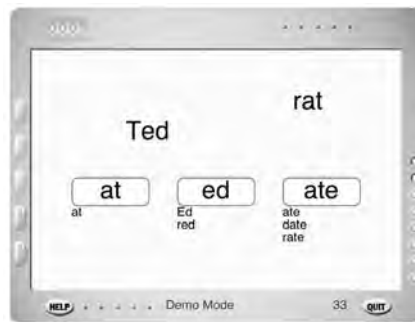
- “Instruction that taught phoneme manipulation with letters helped normally developing readers and at-risk readers acquire PA [phonemic awareness] better than PA instruction without letters” (2-4).
- “When PA [phonemic awareness] training involves teaching students to segment words into phonemes and to select letters for those phonemes, it is the equivalent of teaching students to spell words phonemically” (2-34).
- “Comparison of specific PA skills acquired during training indicated that effects were larger for segmentation and deletion outcomes than for blending” (2-20).

Pattern Detection

In the second part of each *WordMaker* lesson, children sort words according to patterns. In the initial lessons, the patterns involve beginning letters. In later lessons, children learn to sort words into rhymes. Many children discover patterns on their own, but some children need more explicit guidance. The software helps those learners in a process Cunningham refers to as Guided Discovery. Her premise is that the brain is not a phonics rule-applier, but a pattern-detector³ (Caine and Caine) and that children need to be supported to discover the patterns in words in meaningful contexts. NRP found, "...systematic phonics instruction that (focuses) too much on the teaching of letter-sound relations and not enough on putting them to use are unlikely to be very effective" (2-96).

In the last part of each lesson #31 to 139, students transfer what they have learned by spelling new words that were not taught in the lesson. They do this by dragging letters to letter blanks, and demonstrating that they have transferred knowledge from the lesson. Following each transfer spelling step, students must also demonstrate that they can sort the two new words by end rhyme (Figure 3).

Figure 3



Type of Phonics Instruction in *WordMaker*

WordMaker combines three kinds of systematic phonics instruction:

1. Analogy phonics (the transfer step)
2. Onset-rime phonics (the sorting words step)
3. Phonics through spelling (the word making step)

Both analogy and onset-rime phonics programs teach children to use parts of written words they already know to identify new words. The parts used are the beginning letters (onsets) and the rhyming pattern (rime). In analogy phonics, children decode and spell new words by thinking of known words with similar patterns. They use similar words to generate pronunciations for new words. Decoding takes place through a compare/contrast method. When readers come to unfamiliar words:

- They do a fast search through their cognitive word stores for similar words with the same letters in the same places
- They use these analogs to come up with a possible pronunciation
- They cross check for meaning — in context

The National Reading Panel compared synthetic phonics programs, larger-unit programs (which emphasized the analysis and blending of larger subparts of words, (i.e., onsets, rimes, phonograms, spelling patterns) and miscellaneous systematic phonics programs and found that effect sizes for the three categories of programs were all significantly greater than zero and did not differ statistically from each other.

Some of the original research conducted by Patricia Cunningham early in her career^{4-7, 8} (Cunningham; Cunningham and Guthrie) investigated and reported the effectiveness of analogy-based decoding strategies in teaching children to decode words.

In onset-rime phonics, readers decode and spell words by dividing between the onset and rime, pronouncing both chunks and then blending these two pronunciations together. The research supports the use of onset-rimes, intact words (e.g., high-frequency words) and letter-by-letter (phoneme) decoding approaches when teaching reading in a deep orthography, such as English⁹ (Rayner et al).

Spelling-based phonics programs teach children to transform sounds into letters to write words. Uhry and Shepherd¹⁰ found that including spelling as part of the word instruction first-graders receive improved their decoding skills. Davis¹¹ found that spelling-based decoding instruction was as effective as reading-based decoding instruction for all her students, but more effective for the children with poor phonological awareness.

WordMaker and Struggling or Delayed Readers

WordMaker is appropriate for beginning readers or struggling readers of any age, including older students. NRP specifically found that systematic phonics significantly improved the reading performance for struggling readers (those not learning disabled), and is significantly more effective than non-phonics instruction for preventing reading difficulties among at-risk students and in helping to remediate reading difficulties.

The authors of the Florida Center for Reading Research (FCRR) Technical Report #3¹² argued that in addition to the sound basic K-2 curriculum indicated by the National Research Council Report¹³ (Snow et al), the most important additional steps schools need to take in order to ensure that all students learn to read include the identification of resources and procedures for delivering effective small group or individual instruction to higher risk children beginning in kindergarten, extending at least through second grade, and regular assessment of early reading growth to ensure that the needs of all children are being met. *WordMaker* supports both of those steps.

McCandliss, Beck, Sandak and Perfetti¹⁴ investigated the effectiveness of Isabel Beck's instructional strategy, *Word Building*, with students who had failed to benefit from traditional phonics instruction. (*Word Building* is very similar to *Making Words*.) They found that the children who received word building instruction demonstrated significantly greater improvements on standardized measures of decoding, reading comprehension and phonological awareness.

In order to support the needs of special needs students, *WordMaker* has built-in accessibility options, including keyboard shortcuts and single-switch scanning that can be used to run all of the activities.

Reading Engagement

Phonics instruction is often portrayed as dull and meaningless practice. *WordMaker*'s software format addresses this concern by providing activities, graphics and supporting sounds designed to engage students. The activities are intended to encourage learners to engage in experiential learning, guided discovery and knowledge transfer techniques. The individualized lessons and feedback provide guided practice (Figure 4).

The software format also makes it possible to provide immediate corrective feedback on an individual basis. *WordMaker* also provides formative assessment feedback for teachers in the form of reporting of learner progress and a detailed look at patterns of mistakes and successes (Figure 5).

Instructional technology delivery addresses NRP's concerns regarding how to maintain consistency of phonics instruction and at the same time encourage unique contributions from teachers and the related concern of what teachers need to know (2-96). The importance of instructional pacing — another NRP concern (2-97) — is addressed with a self-paced software like *WordMaker*.

Recent Research Supporting *WordMaker*

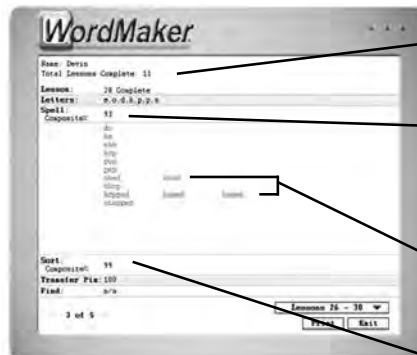
Recent research reviews have affirmed analogy strategies as effective ways to teach decoding. First grade teachers Aiken and Bayer discovered “the particular strength of *Making Words* is teaching students to notice patterns and make discoveries about written language that they could apply to other situations.”¹⁵ Tara Jeffs of East Carolina University investigated the use of *WordMaker* on students with different levels of reading ability and found that the program had a positive impact on first grader's decoding and spelling skills in ten weeks. The group as a whole improved spelling accuracy by 8.4%. The disaggregated data is shown in Figure 6.¹⁶

Juel and Minden-Cupp¹⁷ conducted a microanalysis of first-grade reading instruction for struggling readers, examining which linguistic units were most effective in building word recognition skills. Their conclusion was that instruction that emphasizes onsets, rimes and blending phonemes is more beneficial than teaching students to read by analogy based on rimes alone, and that the most effective teachers they observed of children who entered first grade with few literacy skills combined systematic letter-sound instruction with onset-rime analogy instruction, and taught these units to application in both reading and writing.

Figure 4



Figure 5



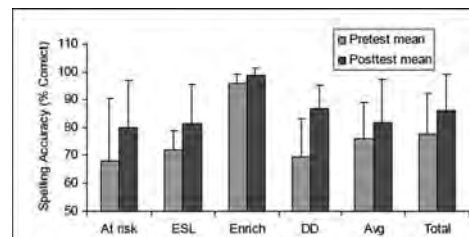
Total number of lessons completed

Composite spelling percentage (# correct/# attempts)

Incorrect spelling attempts

Composite sorting percentage (# correct/# attempts)

Figure 6



Conclusion

The activities in *WordMaker* are supported by research, and the program is systematic, explicit and planned. The program's activities guide children through the process of discovering the patterns in words. *WordMaker* is multilevel and engaging to meet the needs of a range of learners. It is equally effective as a supplement to core reading instruction for all children, or for remedial instruction for students who need additional help.

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