SPELLING RESEARCH

Research on Teaching Children to Spell

Flint Simonsen, Lee Gunter,
and Nancy Marchand-Martella, Ph.D.

Eastern Washington University

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I. Introduction
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Eastern Washington University

Has the importance of teaching students to spell accurately been lost in the age of computers and spell-checkers? Should spelling instruction be considered marginally important in schools today? The practices associated with traditional approaches to spelling instruction suggest that schools and teachers might place less value or importance on spelling as compared to other academic content areas (e.g., reading and math). For example, giving a weekly spelling list on Monday that students are to study for a Friday spelling test is a common approach to teaching spelling. Many times, this approach leaves students having to memorize the spelling list for the test after which the words are forgotten *(Dixon, 1993)*.

It is conceivable that the poor performance of students who are taught using these traditional spelling approaches has left schools and teachers disenfranchised with the idea of teaching spelling skills directly. Additionally, the conventional wisdom regarding the written English language is that its spelling patterns simply make no sense. Many English words are not spelled like they sound, or they have irregular spellings. Given this perception regarding the difficulties surrounding spelling, one should not wonder at the number of children and adults who reportedly have trouble with spelling *(Dixon, 1993)*.

Despite what people may believe about the difficulties inherent in spelling instruction, the written English language does conform to predictable patterns, and more importantly, those patterns can be directly taught to students. Extensive research in the area of spelling (e.g., *Collins, 1983; Dixon, 1991; Graham, 1999*) has lead to the development of cutting-edge spelling curricula (e.g., *Spelling Mastery* and *Spelling Through Morphographs*). In their reliance on research-based principles and practices, *Spelling Mastery* and *Spelling Through Morphographs* are distinct from many other approaches to teaching spelling. Moreover, these curricula have demonstrated substantial effects on the spelling development of children.

This summary of the research literature on spelling instruction will highlight the most promising practices for teaching students to be better spellers. Three major spelling approaches will be discussed. These include the (a) phonemic, (b) whole-word, and (c) morphemic approaches to spelling instruction. The features of each approach will be described as well as how each approach is used in the *Spelling Mastery* and *Spelling Through Morphographs* curricula. Several other research-validated components of these curricula will also be described. In addition, research comparing *Spelling Mastery* and *Spelling Through Morphographs* to other spelling curricula will be summarized.

II. Spelling Approaches

Phonemic Approach

Understanding the relationship between letters and their corresponding sounds is an important skill for successful reading and spelling performance. Within the context of reading, letter-sound correspondence (also known as phonemics) allows students to identify the sounds that correspond to the written symbols (letters) in printed reading passages. For spelling, students identify the written letters that correspond to the spoken sounds. Many words in the English language have regular phonemic patterns. Predictable patterns for regular words allow students to spell these words solely on the basis of their letter-sound relationships. For example, the word *hat* has three sounds /h/, /a/, and /t/ and can be correctly spelled using the three letters that correspond with each of those sounds (*h, a,* and *t*).

The designers of the ***Spelling Through Morphographs*** and ***Spelling Mastery*** curricula recognized the importance of explicit instruction in the letter-sound relationship to spell high-frequency, regular words accurately. Initial lessons in ***Spelling Mastery*** focus on directly teaching students letter-sound relationships. Even after students achieve mastery of phonemics, ***Spelling Mastery*** continues to provide opportunities to practice those skills while learning more difficult content. Although lessons in the ***Spelling Through Morphographs*** curriculum do not explicitly teach students phonemics, the importance of those skills is acknowledged by requiring that students pass an initial placement test to identify mastery of the letter-sound relationship. Students who have not mastered phonemics need basic instruction in those skills. This instruction will enable them to spell many high-frequency, regular-sound words.

Understanding the relationship between printed letters and their corresponding sounds is an essential skill for successful spellers. *Beers, Beers, and Grant (1977)* recommended that students have at least one year of instruction in a systematic phonics-based program to develop skills related to letter-sound correspondence. Furthermore, they argued for postponing spelling instruction until students had received a year of instruction in a phonemic approach. ***Spelling Mastery*** and ***Spelling Through Morphographs*** address the importance of teaching letter-sound relationships by integrating them into a phonemic approach to spelling instruction. Rather than postponing spelling instruction, these curricula directly assess and teach letter-sound relationships.

Technical Note:
Phonemic Spelling Approach

Research has shown that the letter-sound relationship can be taught at a fairly early age. *Treiman, Cassar, and Zukowski (1994)* found that for children as young as kindergarten-aged, the letter-sounds of words play an important role in children's spelling skills. *Waters, Bruck, and Malus-Abramowitz (1988)* supported this finding by showing that in general, children have less difficulty spelling words that are based on predictable letter-sound relationships.

In a meta-analysis that reviewed 1,962 research articles on phonemic awareness, the National Reading Panel (NRP) reported to Congress that teaching phonemic awareness exerts "strong and significant effects" on children's reading and spelling skills, with those effects lasting well beyond the end of training. The NRP also found that systematic phonics instruction boosted the spelling skills of at-risk and normally developing readers as well as students from across the socio-economic spectrum (from low to high SES) *(National Reading Panel, 2000).*

Whole-Word Spelling Approach

The phonemic approach can be used to spell a large number of regularly spelled words (i.e., words that are spelled just like they sound, such as *hat* and *stop*). Unfortunately, not all words in the English language can be spelled correctly using letter-sound correspondence. For example, the word *phone* cannot be spelled correctly by sounding it out. For these irregularly spelled words, a different instructional strategy is required.

The whole-word approach to spelling typically uses some explicit or implicit learning strategy for students to memorize word spellings. In typical whole-word spelling programs, words are grouped together in a list based on some similarity (e.g., similar beginning sound, like */wh/* or */th/*, or words belonging to a common theme, like words related to states or countries). Students are often required to memorize the words for a test given later in the week.

The whole-word approach to spelling instruction has both advantages and disadvantages. The primary advantage to the whole-word approach is that it works very well for words that are considered irregular. Irregular words are words that cannot be spelled by applying general spelling conventions. Some examples of irregular words are: *yacht*, *quiet*, and *friend*. The disadvantage to the whole-word approach is that it relies on rote memorization for all words, instead of taking advantage of phonemic rules that can simplify the task of spelling. Relying solely on rote memorization for spelling could be compared to requiring students to memorize the answers to all multi-digit subtraction problems instead of teaching them the rule for borrowing *(Dixon, 1993)*. To summarize, rote memorization is not the most efficient strategy for spelling instruction, unless the spelling words are irregular, meaning that they cannot be spelled by applying general spelling rules.

There are two fundamentally different approaches that underlie whole-word strategies for spelling instruction. Implicit approaches to instruction rely heavily on the philosophy that exposure to new concepts will lead to the learning of those concepts. Implicit approaches to spelling instruction give students the information that is to be learned *(exposure)*, but they may not provide much guidance on how to learn the information. The use of weekly spelling lists and tests often is an implicit learning strategy. In this approach, the students are provided a list of words to learn and a date to learn them by, but are not given specific instruction for how to learn them.

By contrast, explicit approaches to instruction follow the philosophy that students need to be guided by teachers through specific steps of instruction that lead directly to learning of a skill or concept.

For high-frequency, irregular words that cannot be spelled by applying phonemic rules, ***Spelling Mastery*** and ***Spelling Through Morphographs*** use an explicit, whole-word approach to spelling instruction. A typical whole-word lesson in ***Spelling Mastery*** begins by introducing students to a sentence that contains irregular words *(e.g., I thought he was through.)*. At first, the unpredictable letters or letter combinations are provided, and students must fill in the missing letters *(e.g., _ _ _ ough_   _ _   _ a_   _ _ _ough)*.

Presenting the irregular words in this way teaches the students that even irregular words have some predictable elements. Gradually, the number of provided letters is decreased until students are able to spell all the words without visual prompts. Once the sentence is learned, variations are presented, so that students can apply the spelling of irregular words to various sentence contexts *(e.g., She thought about her homework throughout the night.)*. As can be seen, this explicit approach to whole-word spelling instruction leads students through gradual steps toward the goal of accurate spelling performance.

Technical Note:
Whole-Word Spelling Approach

Two studies that examined an explicit spelling program, *Pratt-Struthers, Struther,* and *Williams (1983)* and *Struthers, Bartlamay, Bell,* and *McLaughlin (1994)* found that the explicit program was effective for increasing spelling accuracy. In the 1983 study, students increased the correct spelling of journal words from 0% to over 80%.

Morphemic Approach

A morphograph is the smallest unit of identifiable meaning in written English. Morphographs include prefixes, suffixes, and bases or roots. Many words in the written English language can be created by following a small set of rules for combining morphographs. For example, the word *recovered* is made up of the prefix *re*, the base *cover*, and the suffix *ed*. Using the principles that govern the structure of words, the morphemic approach to spelling instruction teaches students the spellings for morphographs rather than whole words and the rules for combining morphographs to spell whole words correctly. For example, using a morphemic approach, students would be taught that when a base ends in the letter *e* (e.g., *make*) and is to be combined with the */ing/* suffix, the letter *e* is always dropped (*make* becomes *making*).

The morphemic approach to spelling instruction offers several advantages. First, morphographs are generally spelled the same across different words. For example, the morphograph *port* is spelled the same in the words *porter*, *deport*, and *important*. Second, when the spelling of a morphograph changes across words, it does so in predictable ways. The morphograph *trace* is spelled differently in the words *traces* and *tracing*, but the change is governed by the rule for dropping the final *e*. Third, the number of morphographs is far fewer than the number of words in the written English language, and the number of principles for combining morphographs is relatively small. Therefore, teaching students to spell morphographs and teaching the rules for combining morphographs will allow students to spell a far larger set of words accurately than by teaching individual words through rote memorization of a weekly spelling list.

Use of the morphemic approach to spelling instruction is supported by research studies that have compared the characteristics of intact groups of good and poor spellers *(Bruck & Waters, 1990; Waters et al., 1988).* The findings from these studies confirm that good spellers have a stronger grasp of the principles for combining morphographs than poor spellers. *Bruck and Waters (1990)* divided students into three groups, based on academic skills: (a) *good* (good readers; good spellers), (b) *mixed* (good readers; poor spellers), and (c) *poor* (poor readers; poor spellers). The most significant difference between students in the *good*, *mixed*, and *poor* groups was that good students showed better skills related to the use of morphographs.

Spelling Through Morphographs and *Spelling Mastery* provide explicit instruction in the use of morphographs. Students are taught to spell a small set of morphographs and then learn to combine these morphographs into multisyllabic words. This first step is relatively simple and does not require knowledge of spelling rules. For example, students might learn to spell the morphographs *form + al + ly*, and combine them together to spell the word *formally*. The next step in the morphemic instructional approach requires students to form words that involve previously taught and thoroughly reviewed spelling rules. For instance, when a short morphograph ends with a consonant – vowel – consonant (C-V-C) letter sequence and the next morphograph begins with a vowel, the final consonant is doubled.

These combination rules help students to avoid common spelling mistakes. Students who lack skills using morphographs might have difficulty spelling the words *hopping* and *hoping* (adding the */ing/* suffix to the words *hop* and *hope*). Using the rules for dropping the final *e* and for C-V-C consonant doubling, students will consistently and accurately spell these words (*hop* becomes *hopping* while *hope* becomes *hoping*) and many others that conform to the same morphemic rules. This morphemic spelling approach continues, gradually increasing in difficulty with the addition of new spelling rules and new morphographs. Upon completion of either *Spelling Through Morphographs* or *Spelling Mastery*, students are able to analyze new words that contain morphographs by applying their knowledge of multiple spelling rules.

Technical Note:
Morphemic Spelling Approach

Various spelling studies have compared the characteristics of intact groups' spelling skills. These studies have found that better spellers have a significantly better knowledge of morphographs *(Bruck & Waters, 1990; Johnson & Grant, 1989; Waters et al., 1988).*

III. Spelling Applications

Spelling Mastery and *Spelling Through Morphographs* use carefully structured, teacher-directed learning to systematically teach students to spell. In addition to the phonemic, whole-word, and morphemic approaches to spelling instruction, several other research-validated components have been built into the *Spelling Mastery* and *Spelling Through Morphographs* curricula. Those components include (a) sequenced lessons, (b) cumulative review and distributed practice, and (c) systematic error correction.

Sequenced Lessons

Within the context of teaching academic content domains, several questions are relevant to the design of an effective curriculum. What, for example, is the logical starting point for an instructional unit? Should some skills be taught prior to others? Can student performance be improved by carefully ordering the presentation of instructional materials? For academic curricula based on **Direct Instruction** principles, the answer to these questions is a resounding "yes" *(Adams & Engelmann, 1996; Gersten, Woodward, & Darch, 1986)*. The carefully sequenced lessons of *Spelling Mastery* and *Spelling Through Morphographs* guide students through the process of acquiring and then mastering new spelling skills. The result of these skillfully designed curricula is an efficient and effective approach for teaching spelling.

Spelling Mastery consists of six instructional levels (Levels A through F) and a total of 660 lessons. The lessons within each level are sequenced so that students learn easy spelling strategies (e.g., letter-sound correspondence for predictably spelled words), before more complex spelling strategies (e.g., morphemic spelling rules) are introduced. In addition, within each lesson, the introduction of new content is sequenced to minimize acquisition of misrules. For example, the letters *b* and *d* are introduced in separate lessons to avoid potential confusion between them. The thoughtfully sequenced lessons of *Spelling Mastery* and *Spelling Through Morphographs* carefully teach students to spell while minimizing spelling errors.

Cumulative Review and Distributed Practice

Review and distributed practice provides students with the opportunity to master new skills, and more importantly, to retain those skills across time. The age-old adage that "practice makes perfect" is supported by the research on effective instruction. Practicing a newly acquired skill builds proficiency with the skill *(Engelmann & Carnine, 1982; Gettinger, Bryant, & Fayne, 1982)*. Unfortunately, many spelling programs do not emphasize cumulative review or distributed practice. In traditional basal spelling programs, students typically are not required to review or practice spelling any words for which they have already been tested. Due to the critical role that cumulative review and distributed practice play in the development of good spellers, teachers should provide opportunities for regular review and practice at spelling words that already have been learned *(Collins, 1983)*.

Consistent with these principles, *Spelling Mastery* and *Spelling Through Morphographs* have embedded review and distributed practice into their curricula. Lessons in *Spelling Through Morphographs* have been sequenced, so that spelling words are efficiently learned and then effectively retained. New morphographs are introduced first as units that are always spelled the same way. These newly learned morphographs are practiced using a variety of ver-bal and written exercises. For example, the morphograph *press* is introduced and spelled verbally in a group lesson. Later, the students practice identifying and spelling the morphograph *press* in their workbooks. Once the students have practiced spelling a morphograph in a variety of different activities, they are asked to complete application exercises that require the use of that previously introduced morphograph to spell a variety of words (e.g., *impress*, *pressing*, and *depressed*). Not only does this sequence teach progressively more difficult content, but it also provides review and practice of previously learned morphographs. In general, opportunities to review and practice spelling skills are essential for long-term spelling success.

Systematic Error Correction

Using the systematic and explicit instructional approaches of *Spelling Through Morphographs* and *Spelling Mastery*, teachers are in a position to identify student spelling problems or errors *(Gersten et al., 1986)*. Error correction procedures provide immediate feedback that students can use to improve their performance *(Brophy & Good, 1986; Kinder & Carnine, 1991)*. Error correction procedures can include a variety of different strategies. Examples include circling incorrect responses on a worksheet or delivering a verbal cue, such as "Double-check your answer." Many curricula ignore the importance of teacher corrections for student mistakes, giving preference instead to allowing (even encouraging) students to discover and learn from their mistakes. Although this discovery learning approach may have some intuitive appeal, research has consistently demonstrated that students receiving teacher-directed programs like *Spelling Through Morphographs* and *Spelling Mastery* (programs that incorporate systematic error correction strategies) consistently outperform students in self-directed learning programs *(Becker, 1978; Becker & Gersten, 1982)*.

Several different error correction procedures have been used in effective spelling programs. In one program *(Pratt-Struthers, et al. 1983; Struthers, et al. 1994)* students (a) copy words from a list, (b) cover each word, (c) write each word a second time, (d) compare spellings, and (e) repeat, if errors are found. In another program, students write words that have been missed while spelling them orally. This immediate correction through written and verbal practice has been shown to raise spelling accuracy of students with learning disabilities as much as 34% *(Kearney & Drabman, 1993)*.

In addition to highlighting students' mistakes, error correction can serve an instructive function as well (i.e., by providing information about correct responses). *Spelling Mastery* and *Spelling Through Morphographs* address error correction through a series of structured, teacher-directed responses to student spelling errors. Error correction procedures in these curricula combine (a) a teacher demonstration (i.e., model) of correct responding with (b) guided opportunities for students to respond correctly (i.e., lead), and (c) an assessment of student knowledge (i.e., test).

For example, if a student misspelled the word *friend*, the teacher would model the correct spelling. "Listen: *f-r-i-e-n-d*." Next, the teacher would test the student to see if the model was effective in correcting the error. "Your turn. Spell *friend*." If a student makes a spelling error during this knowledge test, the teacher would model the correct spelling a second time, "Listen again: *f-r-i-e-n-d*," and then would lead the student through guided practice, "With me, spell *friend*. *F-r-i-e-n-d*." The teacher then tests again to see if the correction was effective by asking the student to "Spell *friend*." If the student correctly spells the word on this second test, the teacher backs up in the lesson and re-teaches the part of the lesson where the initial error occurred. This structured teacher response to errors prevents students from making repeated mistakes and provides instructional feedback that helps students become more accurate spellers.

In sum, the use of these systematic **Direct Instruction** principles has resulted in the development of comprehensive approaches to spelling instruction. Moreover, using *Spelling Mastery* and *Spelling Through Morphographs* to teach students to spell has significant advantages when compared with other approaches to spelling instruction.

IV. Comparisions

Comparing *Spelling Mastery* and *Spelling Through Morphographs* to Other Spelling Approaches

Students taught to spell using ***Spelling Mastery*** and ***Corrective Spelling Through Morphographs*** (now known as ***Spelling Through Morphographs***) consistently outperform students taught to spell through other spelling programs. *Darch and Simpson (1990)* found that students who received spelling instruction in ***Spelling Mastery*** outperformed students who were taught to use the strategy of imagining themselves correctly spelling words on a movie screen. *Gettinger (1993) found that students spelled more words correctly after participating in a* **Direct Instruction** *spelling program* (sharing several of the major components of ***Spelling Mastery*** and ***Spelling Through Morphographs***) than students participating in an inventive spelling program (i.e., an instructional approach that encourages students to spell all words phonetically, including words with irregular spellings). Comparisons with more traditional basal spelling curricula *(e.g., Earl, Wood, & Stennett, 1981)* have also demonstrated significant spelling gains for students receiving instruction in ***Spelling Mastery*** or ***Spelling Through Morphographs***.

Several other studies have demonstrated substantial gains in spelling performance by comparing performance both before and after instruction using the ***Spelling Mastery*** and ***Spelling Through Morphographs*** curricula *(Earl et al, 1981; Sommers, 1995)*. For example, *Maggs, McMillan, Patching, and Hawke (1981)* found that directly teaching spelling using ***Morphographic Spelling*** greatly enhanced spelling performance. Both general and special education students made 15-month and 11-month gains, respectively, in spelling performance during an 8-month period. Further, more substantial gains in spelling performance following instruction using ***Corrective Spelling Through Morphographs*** were retained by students 1 year after the end of spelling instruction *(Hesse, Robinson, & Rankin, 1983)*.

In addition, research studies have demonstrated the advantages of using ***Spelling Mastery*** or ***Spelling Through Morphographs*** for a variety of students including general education students at the elementary and middle school levels and students with significant delays in the area of spelling.

In one study, ***Spelling Mastery*** was compared to a district-approved whole word approach in a Title I school. ***Spelling Mastery*** was taught to 446 students in 17 classrooms, grades K to 6 for one academic year. ***Spelling Mastery*** was implemented in 13 classrooms. Four classrooms used the whole-word approach. The results of this investigation demonstrated that spelling skills of students exposed to ***Spelling Mastery*** greatly improved as measured by pre- and posttest standard scores on the *Test of Written Spelling-3*. Although only small differences were found between ***Spelling Mastery*** and the whole-word approach, all comparisons favored ***Spelling Mastery*** (*Burnette et al. 1999*).

A descriptive study by *McCormick and Fitzgerald (1997)* reported scores on the *South Australian Spelling Test* for 22 students taught with ***Spelling Mastery*** Level F. Eighty-one percent of the students scored at least one year above the average for their age group on the norm referenced test. Sixty-eight percent scored at least two years above the average. No student was in the bottom 50%.

A third study (*Vreeland, 1982*) evaluated three different spelling programs in three fourth grade classrooms. Students were tested in November and again in May using the *Test of Written Spelling*. Students in ***Spelling Through Morphographs*** increased from 3.9 to 5.6, a 1.5 in total test grade equivalent scores, approximately twice those of the comparison groups (.8 and .7).
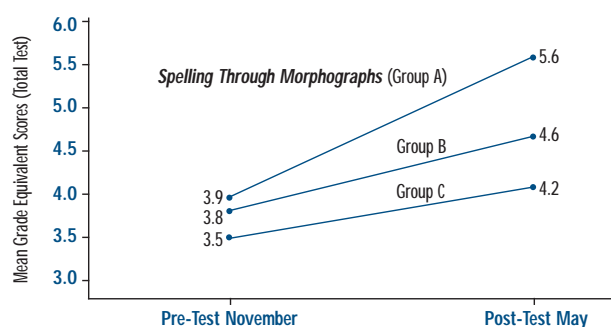
Robinson and Hesse (1981) compared effects of ***Spelling Through Morphographs*** to a teacher-selected approach on spelling skills of seventh grade students. Students in the ***Spelling Through Morphographs*** group performed significantly better. This was especially true of the low- and average-achieving students. On two subtests, the group labeled **Direct Instruction** low-achieving students scored higher at posttest than the high-achieving control group students.

Spelling is an important academic skill for students to learn in schools. Further, spelling can be taught directly and systematically. *Spelling Mastery* and *Spelling Through Morphographs* teach children to spell accurately through teacher-directed phonemic, whole-word, and morphemic instructional approaches. Several evaluations of *Spelling Mastery* and *Spelling Through Morphographs* have provided strong and compelling evidence for the adoption and sustained use of these curricula. Further these curricula have demonstrated substantial effects on the spelling development of children.

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