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A Tale of Two Closely Related Skills: Word Reading and Spelling Development and Instruction

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Imagine reading the following text: 어느 마을에 한 소녀가 살았습니다. One will not be able to comprehend this sentence unless she or he can read Korean—is able to decode characters and words in the Korean orthography and has an understanding of the Korean language. This example illustrates the absolutely necessary role of word reading in reading comprehension. Similar is the case of spelling for writing, that is, spelling is necessary for writing texts. Although the ultimate goals of reading and writing instruction are not word reading and spelling per se, there is no reading comprehension or written composition without word reading and spelling skills. In this chapter, we focus on word reading and spelling, with particular attention to their connections and instructional implications. To this end, we briefly review the roles of word reading and spelling in theoretical models of reading comprehension and written composition as well as the developmental progression of word reading and spelling skills. We then focus on building foundations of word reading and spelling—emergent literacy skills such as phonological, orthographic, and morphological awareness—and research-informed teaching practices of emergent literacy skills, word reading, and spelling. The following are

guiding questions for this chapter.

Guiding Questions:

- What is the developmental progression of reading and spelling skills?
- What skills contribute to the development of word reading and spelling skills?
- What are research-informed teaching practices that support synergistic development of word reading and spelling skills?

The Roles of Word Reading and Spelling in Reading Comprehension and Written Composition

Reading comprehension and written composition are two of the most complex tasks in which individuals engage during schooling and in their adult lives. Multiple theoretical models have been proposed to explain reading and writing processes, and the skills that contribute to reading and writing development. Although the nature and focal aspects of these various theoretical models differ, all recognize the roles of the ability to read/decode words in reading comprehension, and the ability to spell/encode words in written composition. For example, according to the simple view of reading, word reading and listening comprehension are two global skills that are necessary for reading comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). Other models such as the Reading Systems Framework (Perfetti & Stafura, 2014) and the direct and indirect effects model of reading (Kim, 2017, 2020a, 2020b) include greater details about processes and skills that are involved in word reading and listening comprehension.

The essential role of spelling in writing texts is also recognized in theoretical models such as the simple view of writing (Juel et al., 1986), not-so-simple view of writing (Berninger & Winn, 2006), and the direct and indirect effects model of writing (Kim, 2020c; Kim & Park, 2019; Kim & Schatschneider, 2017). Writing requires generation, translation, and transcription

of ideas, and spelling is part of the transcription process. Simply put, writing by definition requires a written product, and therefore, writing requires spelling skills. In addition, dysfluency with spelling skill hinders the writing process by interfering with idea generation and coheren-building process. An abundance of evidence indicates the necessary role of spelling in written composition (Abbott & Berninger, 1993; Graham et al., 1997, 2002; Kim et al., 2011, 2015; Kim & Schatschneider, 2017).

Although the theoretical models above focus on either reading or writing, another line of work has recognized reading-writing connections (see Kim, 2020d and Shahahan, 2016 for a review). According to this rich body of work, reading and writing are interdependent systems, drawing on highly similar skills (Fitzgerald & Shanahan, 2000; Kim, 2020d). This applies to lexical-level skills, word reading and spelling, such that word reading and spelling are founded on the same skills and knowledge, and they develop interactively, mutually supporting each other (see below for details).

Phases of Word Reading and Spelling Development

Word reading and spelling skills are not *either-or* phenomena. Instead, they develop on a continuum through phases with practice and exposure which is greatly facilitated by systematic instruction, and ultimately children need to develop automaticity where their word reading and spelling are automatic and do not require mental effort. According to Ehri (2005), the developmental progression of word reading is as follows: (1) pre-alphabetic phase, (2) partial alphabetic phase, (3) full alphabetic phase, (4) consolidated alphabetic phase, and (5) development of automaticity. The word "alphabetic" here refers to the alphabetic principle that graphemes—letters and groups of letters (e.g., *sh* in *ship*)—represent sounds or phonemes. In the *pre*-alphabetic phase, the child has not developed an understanding of the alphabetic principle

and adopts a visual cue approach in reading. For example, the child would recognize a word, say McDonalds, for its visual cue as a whole (e.g., an arch). In the *partial* alphabetic phase, the child uses partial phonological cues (including knowledge of letter names) for word reading. In the *full* alphabetic phase, the child is able to "form connections between all of the graphemes in spellings and the phonemes in the pronunciations to remember how to read words" (Ehri, 2005, p. 148) and has complete knowledge of grapheme-phoneme correspondences. In the *consolidated* phase, the child develops an understanding of a consolidated unit of letter sequences (e.g., *caught, taught; react, redo*) and reads by these units rather than graphemes. In the *automaticity* phase, word reading is not only accurate but also fast because spellings of words are fully secured to their pronunciations in memory, and as such they are retrieved automatically and immediately without analytic retrieval (i.e., not using the process of retrieving and assembling phonemes associated with each grapheme). In this phase, whole words are recognized by sight without requiring attentional resources.

Spelling development has been described as having five stages: (1) emergent/precommunicative, (2) letter name, (3) within word, (4) syllables and affixes, and (5) derivational relations (Bear et al., 2016; Gentry, 1982). The emergent/precommunicative stage is similar to the pre-alphabetic stage in reading development where children lack an understanding of the systematic relation between letters and sounds. In the letter name phase, children use their knowledge of letter-sound correspondences, but accuracy tends to be limited to consonants at the beginning and end of a word, and short vowels. In the within word phase, children can spell most single-syllable words with short vowels but have difficulties with silent long-vowel patterns. In the syllables and affixes phase, the errors tend to occur at syllable junctures and in unaccented syllables. In the derivational relations phase, errors are with low-frequency multisyllabic words

involving derivational morphemes. These developmental phases are not lockstep, and children access and utilize knowledge of multiple sources (e.g., phonology, orthography, and morphology) across the phases, depending on the nature of the words and the availability of children's knowledge (see Apel & Masterson, 2001; Siegler, 1996; also see Pollo et al., 2008; Treiman, 2017a, 2017b).

Emergent Literacy Skills and Word Reading and Spelling Skills

What skills contribute to the development of word reading and spelling skills? Here we introduce the concept and term *emergent literacy skills*. The concept of 'emergent' literacy skills is that literacy skills such as reading and writing develop or emerge from prereading or precursor skills that are foundational for reading and writing development. These include knowledge and awareness of phonology, orthography, and morphology, and oral language skills such as vocabulary and listening comprehension (Kim, 2020a). In this chapter, we focus on phonological awareness, orthographic awareness, and morphological awareness as they are critical for word reading and spelling.

Phonological awareness is one's knowledge and awareness of structure of speech sounds in a language (National Institute of Child Health and Human Development [NICHD], 2000). For example, in English, the word *cat* is a single syllable word pronounced as /kæt/. The syllable can be broken into smaller units of sounds, onset /k/ and rime /æt/. Onset is the consonant(s) before the vowel within a syllable. Rime is the vowel and following consonant(s) within a syllable; although a vowel is necessary, consonants are not. The rime /æt/ can be segmented into phonemes /æ/ and /t/. Phonemes are the smallest unit in a speech sound. In the word *cat*, the onset /k/ is also a phoneme and therefore *cat* consists of three phonemes /k/, /æ/, and /t/. Figure

2.1 shows the phonological structure of a syllable in English for the word *cat*. The same breakdown can be applied to the multisyllabic word *react*, which is composed of two syllables /ri/ and /ækt/. In this case, the syllable /ri/ has an onset /r/, and rime /i/. The rime does not contain a consonant in this case. In the syllable /ækt/, there is no onset. The rime /ækt/ can be broken into three phonemes, /æ/, /k/, and /t/. Notice that there are two consonant phonemes /k/ and /t/ without a vowel in between, which is called a consonant cluster (see Moats, 2010). Phonological awareness develops from a larger unit (syllables) to a smaller unit (phonemes).

Insert Figure 2.1 *Phonological structure of a syllable* […] Approximately here

Orthographic awareness is the knowledge and awareness of print functions (print concepts), graphemes, and permissible patterns in an orthography (e.g., *tr,* but not *tl,* is allowed in the syllable initial position in English). Graphemes include individual letters (shapes, names, and sounds of alphabetic letters) and groups of letters (e.g., the digraph *sh* in *ship*). Learning to read or spell in English is not as simple as mapping individual letters to individual sounds (e.g., letter *t* representing /t/). Groups of letters, called digraphs or trigraphs etc., also represent a phoneme. High-frequency consonant digraphs include *th* (*that*, *thin*), *sh* (*ship*), *ch* (*chip*), *wh* (*what*), and *ph* (*phone*). In some consonant digraphs, one of the consonant letters is silent (e.g., *wr-, kn-, ps-, -bt, -lm*). There are also vowel digraphs (e.g., *ea, ei, ee, ou, a_e, i_e, o_e*) as well as digraphs and trigraphs that include both consonants and vowel letters (e.g., *qu-, -dge*). Because phonemes map onto graphemes, not just individual letters, knowledge of grapheme-phoneme correspondences is the key to word reading and spelling (see Figure 2.2 below).

Insert Figure 2.2 *Word reading and spelling processes for the words 'cat' and 'caught*' approximately here

Morphological awareness refers to the knowledge and awareness of morphological structure of a word. Morphemes are the smallest unit of meaning. Intuitively it might appear that individual vocabulary words are the smallest unit of meaning, but morphemes are. For example, the word *cats* has two morphemes, *cat* and *-s* for plural. The word *react* is composed of two morphemes, *re* and *act*. The word *incredible* has three morphemes (*in-cred-ible*). Morphemes are classified into categories such as base words, derivational prefixes, derivational suffixes, and inflectional suffixes (see Figure 2.3).

Insert Figure 2.3 *Categories of morphemes approximately here*

Why are phonological awareness, orthographic awareness, and morphological awareness important to word reading and spelling in English? Understanding the writing system of English—an alphabetic or a morphophonological writing system—gives a clue. In the alphabetic writing system, orthographic symbols like alphabet letters principally represent speech sounds, not meanings. Therefore, the key to decoding words in alphabetic writing systems is an understanding of the alphabetic principle and correspondences between letters and groups of letters to appropriate speech sounds. For instance, we read the word *cat* as /kæt/, not anything else, because the letters *c-a-t*, respectively, represent /k/, /æ/, and /t/. As shown in Figure 2.2, when the child sees the word *cat,* they have to retrieve sounds associated with each letter. Letters *c* and *a* are often associated with multiple sounds, so the reader has to select one sound over the other options. They then have to assemble and blend the sounds in correct order to pronounce /kæt/. The word *caught* is more complex because it involves a grapheme *augh* representing the phoneme /ɔ/. The child's attempt to use the letter-by-letter processing will not be a successful

strategy for this word (see Figure 2.2). Instead the child has to process, recognize, and use their knowledge of the grapheme *augh* for /ɔ/ or *aught* for /ɔt/ as a unit.

The process of spelling is the reverse of that for word reading. The child needs to have an accurate representation of the sounds in a target word, say /kæt/, and therefore, the child's lack of understanding of the sounds (i.e., phonological awareness) would lead to an incorrect spelling. The child then has to retrieve their knowledge of graphemes or larger units associated with each identified phoneme, followed by selecting correct graphemes, assembling them in correct order, and forming letters accurately (see the bottom panel of Figure 2.2).

Morphological awareness also plays an important role in word reading and spelling, particularly for multimorphemic words. Consider the example of *react*. If one applies the knowledge of vowel digraph *ea*, it is reasonable to read this word as /rikt/ (*reeked*) because *ea* frequently represents /i/ in English (e.g., *r<u>ea</u>p*, *ch<u>ea</u>p*). Of course, /rikt/ is not an accurate reading of *react*. Then what knowledge is needed to correctly read the word? English has a morphophonological writing system in which morphemic information, in addition to phonological information, is represented in the spelling of words. Therefore, morphological information overrides what appears to be vowel digraph *ea* so as to read *react* correctly as /riækt/. The same applies to spelling. If the child has an understanding of the morphemic structure of the word *react*, they are more likely to accurately spell the word. Morphology is particularly prominent for words in academic content areas such as social studies and science where words are frequently composed of multiple morphemes (e.g., *photosynthesis*, *chronology*, *magnification*).

The roles of phonological, orthographic, and morphological awareness in word reading and spelling are well established in theoretical models of word reading (Adams, 1990;

Seidenberg & McClelland, 1989) and spelling (Bahr et al., 2012; Treiman, 2017a). This is widely referred to as the triangle model of word reading (Adams, 1990) or triple word form theory (Bahr et al., 2012). It is important to highlight that both word reading and spelling draw on essentially the *same* skills. This has three important implications. First and foremost, early literacy instruction should target these skills to promote development of word reading and spelling. Abundant research indicates that teaching these skills improves word reading and spelling, and no explicit and systematic teaching of these skills puts children at risk for reading and writing difficulties (National Early Literacy Panel, 2008; NICHD, 2000). Second, if word reading and spelling draw on the same skills, children's word reading and spelling skills are strongly related (r = .82; Kim, Wolters, & Lee, 2021). It also entails that children who are strong in word reading will likely be strong in spelling and vice versa, and similarly those who are weak in word reading will likely be weak in spelling and vice versa. In fact, it is well documented that children with dyslexia also have persistent difficulties with spelling (e.g., Berninger et al., 2008; Graham et al., 2021).

The third important implication is that integrated teaching of word reading and spelling has a synergistic effect and facilitates the acquisition of both word reading and spelling (Graham et al., 2017). Teaching of word reading promotes spelling, and teaching of spelling promotes word reading because quality teaching of word reading or spelling involves teaching emergent literacy skills. Spelling practice, particularly during the early phase of spelling development, involves attention to sounds of words (phonemes) and representing them with letters, and this experience reinforces the mapping between phonological information and graphemes (Arra & Aaron, 2001; Ellis & Cataldo, 1990). Similarly, word reading involves converting graphemes to phonemes, which reinforces grapheme-phoneme correspondences. Therefore, an effective

phonics instruction involves both ways of conversion—grapheme-phoneme conversion (word reading) and phoneme-grapheme conversion (spelling)—as these are two sides of the same coin (Ehri, 1997). Phonics is not just a reading instructional approach; it is also a spelling instructional approach. In fact, effective phonics instruction systematically integrates word reading and spelling instruction to reinforce and support coding into memory and analyzing phonological, orthographic, and morphological information.

Note that the strong relation between word reading and spelling does not entail that word reading and spelling are identical (Ehri, 1997; Shanahan, 2016). Word reading requires recognizing and identifying graphemes, retrieving associated phonemes, and assembling the phonemes in correct sequence. Spelling, on the other hand, requires identifying phonemes in the target words, retrieving associated graphemes, and assembling the graphemes in correct sequence, and forming the letters in correct shapes (see Figure 2.2). Word reading largely requires a *recognition* of patterns whereas spelling requires a *production* of a series of letters in accurate sequence. As such, spelling is typically more difficult than word reading. For instance, to read the word *caught* accurately, one needs to recognize the pattern -*aught* for /ɔt/ whereas in spelling, one needs to accurately sequence the five letters *a, u, g, h, t* in correct order.

How Can Teachers Support Development of Word Reading and Spelling Skills?

Foundations for effective teaching

Decades of research have revealed several general principles for effective instruction. The first principle is that children differ in the rate at which they acquire word reading and spelling skills; therefore, for maximally effective instruction, teachers need to identify their students' strengths and needs and provide instruction that is tailored to those needs—that is,

differentiated or individualized instruction. This type of instruction involves assessments of students' word reading and spelling skills as well as phonological awareness, orthographic awareness, and morphological awareness, and using assessment data to make instructional decisions such as grouping students by their strengths and needs. This practice is called data-based instructional decision-making (see McMaster et al., 2020). Children differ in their needs of target skills because some children are already proficient in target skills (e.g., phonological awareness) while others are not. Children also vary in their learning time for mastery. It is important to recognize that differentiated instruction is *not* tracking. In tracking, students are not allowed to flexibly move into and out of ability groups. In differentiated instruction, students are grouped and regrouped flexibly throughout the year depending on their progress in target skills. The goal of differentiated instruction is to best meet students' needs, and grouping would differ depending on individual student progress.

The second principle is consideration of students' language backgrounds in planning and delivery of instruction. Students in modern classrooms are from diverse linguistic backgrounds, including monolingual learners, multilingual learners, those who have limited proficiency in language of instruction, and those who speak nonmainstream American English (e.g., African American Vernacular English [AAVE]). This implies that teachers need to have knowledge about language development and language experiences of children from diverse backgrounds (see Fillmore & Snow, 2000). For example, students with limited English proficiency by definition need instruction on English language in addition to literacy instruction. These children bring their L1 language skills that can be transferred to support their learning of the English language and their word reading and spelling in English (Vaughn et al., 2006; Wawire & Kim, 2018). Multilingual learners (e.g., those who are proficient in more than one language, including

the language of instruction, English) are different from English learners as they already have proficiency in English as well as other languages. Essentially they are akin to monolingual learners of English but have proficiency in additional languages. Those who speak AAVE speak proficient English but not the 'standard' English dialect. Phonological and morphological features of AAVE have important implications for word reading and spelling acquisition for AAVE speakers (see Craig et al., 2003, for details). The good news is that effective teaching of word reading and spelling (see below) works for all children regardless of children's linguistic or cultural backgrounds (August et al., 2009) as long as teachers recognize, understand, and value children's linguistic backgrounds and make appropriate adaptions.

The third principle is about instructional delivery—using evidence-based pedagogical approaches. This includes explicit and systematic teaching, and establishing evidence-based instructional routines. Explicit instruction refers to "a structured, direct, clearly articulated methodology for teaching target skills" (Kim & Davidson, 2019, p. 2). Systematic instruction is a step-by-step teaching in manageable steps and logical sequences (e.g., easy tasks to more challenging tasks). Explicit and systematic teaching deliberately includes opportunities for practice. Practice refers to carefully prepared opportunities "for rehearsing, reviewing, and retrieving newly learned material in order to support robust learning" (Kim & Davidson, 2019, p. 2) and should not be confused with a "drill." Another important aspect of instructional delivery is establishing instructional routines. Humans learn new material best when it is presented in the context of their existing knowledge network, and a brief review of previous learning before presenting new material facilitates learning (Rosenshine, 2012). This is followed by teacher modeling of target skills and opportunities for guided and independent practice along with teachers' corrective feedback. This is widely known as the I DO, WE DO, YOU DO model. The

key point of this pedagogical approach is the provision of instructional scaffolding, which is gradually reduced for eventual independent work by students (see Kim & Davidson, 2019, for details).

Research-supported recommendations for teaching word reading and spelling

For the majority of children, word reading and spelling skills do not develop 'naturally' (Rayner et al., 2001), and development from the pre-alphabetic phase to the automaticity phase largely depends on devoted explicit and systematic teaching of emergent literacy skills, word reading, and spelling, not just an exposure to print. This is widely known as phonics, which is an instructional approach that explicitly teaches grapheme-phoneme correspondences. The following are four recommendations for effective teaching of word reading and spelling based on theory and empirical evidence.

1. Teach phonological awareness and grapheme-phoneme correspondences

Although a starting place for phonological awareness instruction depends on assessment results, instruction should consider grain size (syllables, rimes, and phonemes) and task/activity demands. Recognition of sounds precedes manipulation of them, and tasks/activities increase in difficulty from matching to oddity, counting, blending, segmenting, deletion/elision, and substitution. Table 2.1 shows an example of these phonological awareness activities. For instance, for a syllable task, the student can be asked to identify the number of syllables in the words *homework* and *ballpark*. This can be followed by blending of these words, *home-work* to *homework*, and *ball-park* to *ballpark*. In phonemic awareness tasks, difficulty also depends on the position of the sound. Identifying phonemes in the initial position is easiest, followed by the final position and then the middle position. For instance, for the word *cat*, the easiest sound to identify is the first sound, /k/, followed by /t/ and then /æ/. Note that pronouncing consonants in

isolation without a vowel is not natural for children, and therefore, drawing their attention to articulation of isolated consonants can be helpful (e.g., using pictures that show the mouth when articulating a sound or drawing attention to the teacher's mouth). Picture sorting is also another approach. In picture sorting, the child is shown pictures of familiar objects that contain target sounds (e.g., pictures of *sun*, *sock*, and *ball*; *fan*, *pants*, *five*) and is asked to sort them according to the shared sounds (a matching task) or different sounds (an oddity task). Elkonin boxes are also widely used where a square box is mapped onto sounds (and graphemes) because boxes add concreteness to understanding sound manipulation.

Insert Table 2.1 Approximately here

Teaching letters and groups of letters (e.g., digraphs) is also a crucial part of word reading and spelling instruction. A few things to be mindful of when teaching letters are as follows.

- Provide opportunities for frequent exposure. The relation between letter shapes and letter names is artificial just like vocabulary words (there is no inherent relation between an object *desk* and why we call it *desk* in English). Therefore, learning letter shapes and names requires the same principle as learning vocabulary—children need to be exposed to letters and their names frequently (Kim, Petscher et al., 2021). One research-based approach to facilitate the connection between letters and their names is embedded/integrated picture mnemonics. In this approach, the shapes of letters are linked to familiar objects, for example, *B* resembling a bee, or *S* a snake (Ehri et al., 1984; Shmidman & Ehri, 2010).

- Consider visual similarity. Many letters in English share visual similarity. For example, letters *b* and *d* are identical shapes when reversed. Many other letters also share similarity (e.g., p-q, m-n, n-h, g-q, i-l, i-j, E-F, B-D, B-P, U-V). Visual similarity creates confusion (Kim, Petscher et al., 2021; Treiman & Kessler, 2003). Not surprisingly some children show reversal in their letter writing, and persistent use of reversal is related to poorer spelling performance at a later time (Treiman et al., 2019). One strategy when teaching visually similar letters is not to introduce them in adjacent sequence. For instance, although *n* immediately follows *m* according to the alphabet sequence, they do not have to be taught back to back. In addition, drawing students' attention explicitly to distinguishing features between target letters can help mitigate confusion (e.g., *h* has a long stick compared to *n*). Another strategy is spending a different amount of time for teaching more difficult letters rather than the widely popular approach of a letter a week.
- Make the connection between letter names and letter sounds explicit. Some letter names provide concrete clues about their sounds. For example, the letter name for *b* contains the sound value /b/ in the beginning of the name /bi/. The letter name for *f* contains the sound value of /f/ at the end of the name /ɛf/. Explicitly identifying these clues aids students' letter sound learning. Note though that some consonant letters such as *h* and *w* do not provide a clue about letter sounds. Vowel letters in English represent many sounds in different contexts, and in fact, the phoneme-grapheme correspondences for vowels are a persistent challenge for children; thus, an explicit and systematic instruction is critical.
- Teach for accuracy *and* speed. Like any learning, achieving automaticity for letter names and sounds is important. In other words, children should reach mastery so that their identification of letter names and sounds is automatic. This means fast retrieval of

information, which facilitates children's application of letter knowledge during word reading and spelling processes.

- Teach letter writing. In addition to letter name and sound knowledge, students should be taught letter writing as well. This is important for two reasons. First, multimodal learning helps secure learning of letters in children's memory (see dual coding theory; Paivio, 1991), and thus, letter writing supports learning of letter shapes. Second, letter writing automaticity helps development of spelling and written composition (Kim & Park, 2019; Santangelo & Graham, 2016). Instruction of letter writing should include the order of the strokes and well-formedness. Beyond accuracy, sufficient practice opportunities should be provided for speed and automaticity of letter writing.

2. Teach chunking

As noted above, in the beginning phase of word reading and spelling development, children learn the correspondences between individual graphemes and phonemes, the foundation for word reading and spelling. As children develop their word reading skill, however, this approach is inefficient and slow. Instead, they need to recognize chunks larger than individual graphemes, store them in memory, and use them in word reading and spelling. Ultimately, recognizing words as a whole by sight automatically is the goal (see the automaticity phase above). Figure 2.4 shows the mapping of speech sounds (phonology) and meaning (morphology) to a written representation (orthography) for various gain sizes such as phonemes and graphemes, rimes and phonograms, and syllables and syllable types as well as morphemes. Chunking can be done in phonograms, syllables, and morphemes.

Phonograms as a unit for chunking. Phonograms are technically a letter or groups of letters (i.e., graphemes). The term is also widely used to refer to spellings that correspond to the rime unit in phonology. For example, -*ock* in the following words is a phonogram: *sock, lock,* and *rock*. These words share the same rime and share the same spelling. Therefore, applying this knowledge facilitates word reading and spelling. For example, a child does not know how to spell the word *dock*, but if they know how to read and spell the word *sock*, they can use this knowledge to spell *dock* (this is called analogy; Goswami, 1994). Word building and word sort are effective activities for phonics in general and can be applied to teaching phonogram as a unit. Examples can be found below.

Word building. The word *sock* is written on the board. The teacher models reading the word according to the onset-rime units, *s*-*ock*. Then the teacher brings attention to the spelling of *ock* for the /ɑk/ sound. Replaces the letter *s* in *sock* with the letter *l* (lock), and points out the spelling of *ock* for the sound. Repeats with other words (e.g., *rock*, *dock*, *shock*).

Word sort. Word cards are prepared for the words *sock*, *lock, rock*, and *dock* and for the words *bag, tag,* and *rag*. The teacher does a model think-aloud, explicitly articulating the target patterns: -*ock* and -*ag* (I DO). Then, with the help of children, the teacher moves a word under one of the patterns (WE DO). Then, children are asked to sort the words according to shared sounds and spelling patterns (YOU DO). Throughout the week, students work with these patterns engaging in varied versions of word sort. See Bear et al. (2016) for excellent details and resources for word study for word reading and spelling instruction.

Syllables as a unit for chunking. The transition to reading and spelling multisyllabic words is formidable for many children. Therefore, recognizing syllables as a chunk is part and parcel of

effective phonics instruction. For example, unaccented vowel schwa (e.g., /ə/ as in *about*) is a challenge in reading and spelling because children have difficulty identifying the sound as it is unstressed vowel, and it is spelled with all the five vowel letters in English (a, e, i, o, u). Also challenging are unaccented final syllables such as -al (e.g., *trial, annual, causal, mammal, signal*), -il (e.g., *tonsil, pupil, fossil*), -el (e.g., *fuel, tunnel, pretzel, cruel*), or -le (e.g., *fiddle, beetle, circle, cradle*). R-controlled vowel /ər/ or /ɚ/ also present challenges because they are spelled in different ways: -ar (e.g., *dollar, solar, lunar*), -er (e.g., *toaster, trouser, pitcher*), -or (e.g., *rumor, motor, razor*), and -ure (e.g., *culture, feature, lecture, pressure, leisure, conjure*). Because there are no strong rules for these patterns and there are always exceptions, word study or word sort is a great way to teach these patterns (see Bear et al., 2016).

Other patterns that children confuse particularly in spelling are doubling of consonant letters and dropping letter *e* (e.g., *shopping, jogging, skipping; reading, chewing, looking; writing, changing, shining*). Doubling of consonant letters is used as a means to indicate that preceding vowels are a short vowel (e.g., *hop* → *hopping* compared with *hope* → *hoping*). The letter *e* is dropped when it is at the end of the word and suffixes (e.g., -ing, -ed) are added. Although there are exceptions (e.g., *taxing* for the doubling consonant; *being* for dropping *e*), these general observations about these patterns are useful and, thus, should be taught. Again word sort can be a great approach to teach these patterns.

Morphemes as a unit for chunking. Recognizing morphemes and associated spellings, storing them in memory, and then using this knowledge helps support development of word reading and spelling. As shown in Figure 2.3, morphemes can be classified into several categories. Students need to be taught that words are composed of meaningful units, and these units map onto

spelling. For example, the past tense morphological marker is *-ed* (e.g., *wanted, painted, played, learned, walked, jumped)*. In spelling, students need to learn that the sounds of the *-ed* differ depending on the nature of words, but they are all spelled with *-ed*. In word reading, it should be explicitly pointed out that although these words end with the same spelling pattern (*-ed*), their sounds differ because of the last sound in the preceding part (e.g., when *-ed* is preceded by /t/, it is pronounced as /ɪd/).

An instructional approach incorporating morphological awareness is widely known as morphemic analysis or structural analysis, and typically involves recognizing morphemes and associated spellings beginning readers. This is important for beginning readers. However, morphological awareness instruction should not wait until children develop initial word reading and spelling skills. Instead, morphological awareness should be taught to prereaders just like phonological awareness. For example, counting and substitution can be used to teach prereaders that words are composed of multiple morphemes (e.g., *jumped* has two meaningful units, *jump-ed*; *redo* and *active* have two meaningful units, *re-do* and *act-ive*).

Insert Figure 2.4 Mapping between oral language […] approximately here

3. Teach decoding and encoding

The aforementioned instructional approaches—teaching phonological awareness and grapheme-phoneme correspondences, and chunking—are not end goals by themselves, but instead they are in service of word reading and spelling. This implies that instruction of phonological awareness and letters should explicitly address blending the decoded sounds into a word for word reading, and encoding sounds into a series of graphemes and assembling them for spelling. Studies have shown that combing instruction on phonological awareness and letter-sound correspondences with word reading and spelling better develops students' word reading

and spelling skills (e.g., Ehri et al., 2009). Powerful tools for decoding and encoding are word building and word study/sort (see above). Word dictation is another powerful tool. Although dictation is typically used as an assessment tool for spelling, it can be a useful instructional tool as well. For example, the teacher can model dictating a target word as follows.

> My word is cat. /kkæætt/. I hear three sounds /k-æ-t/. The word /kæt/ begins with a /k/ sound and has /æ/ and /t/ sounds. What letters make a /k/ sound? I know letters *c* and *k* do. For this word, I am going to write down the letter *k*. Which letter makes an /æ/ sound? I know that the letter *a* does so I am going to write down the letter *a* right after the letter *k*. Now I need a letter for the /t/ sound so I am going to write down the letter *t* right after the letter *a*. Now I have *k-a-t* for the word /kæt/. Hmm, this does not look quite right. The letter *k* in the beginning seems odd. I am going to try replacing it with a *c*, so now I have *c-a-t* for the word /kæt/. Does this look right to you all? That's right. Let's read this word together /kkæætt/ (moving your finger under each letter as it is read). How do you spell the word /kæt/? c-a-t.

This can be followed by a WE DO practice with another word, for example, *bat*. Then, students can try on their own with other words such as *pat* and *rat*.

Another important aspect of word reading and spelling instruction is teaching of irregular words, words that do not follow common grapheme-phoneme correspondences, such as *was, you, to, should, of, have, give, listen, answer,* and *come*. These are typically taught as sight words, using a whole-word approach, where students are asked to memorize the word as a whole without analyzing it using their knowledge of grapheme-phoneme correspondences. However, this approach does not capitalize on the letter-sound relations that exist in these words. For

example, the word *should* /ʃʊd/ follows the common letter-sound correspondences for the letters *sh* and *d* but the silent letters *oul* are an exception. Therefore, an analytic approach for *sh* and *d* is applicable for *should* and other irregular words as well, and this approach for word reading and spelling instruction improves students' learning (Miles et al., 2017).

As students try to apply their knowledge of grapheme-phoneme correspondences in word reading and spelling, they will invariably make errors. In spelling, this is called 'invented spelling.' Although invented spelling is an inaccurate spelling of words (e.g., *kande* for *candy*), invented spelling provides excellent opportunities for students to practice and reinforce their knowledge of grapheme-phoneme correspondences. As such, use of invented spelling is associated with growth of spelling skills as long as students are provided with corrective feedback (e.g., Ouellette & Senechal, 2008).

It is worth noting here that students' spelling errors reveal a great deal of insights about the status of their knowledge and awareness about phonology, orthography, and morphology. In other words, spelling errors are a window into children's developmental stage of spelling *and* word reading, and what they know, what they use but confuse, and what their instructional needs are. For example, the spelling of *kande* for *candy* shows that the child has an understanding of the sounds included in the word (i.e., phonological awareness). Furthermore, the child has knowledge of graphemes for /k/, /æ/, /n/, and /d/ phonemes. The child also used their letter-name knowledge of *e* for an /ɪ/ sound. In terms of immediate instructional planning for this child, the teacher may teach the child that letter *c* is used before the vowel letters *a*, *o*, and *u*. By analyzing patterns of errors in the child's spelling, the teacher can identify their knowledge and needs, and plan word reading and spelling instruction accordingly (see Bear et al., 2016, for a spelling inventory associated with developmental phases).

4. Incorporate connected texts

The end goal of word reading and spelling instruction is for students to use these skills in reading connected texts and producing connected texts. Therefore, it is important to provide opportunities to practice reading and spelling words in isolation *and* in connected texts. In terms of reading, connected texts include decodable texts and authentic texts. Decodable texts are texts in which the decodability of words is controlled such that the majority of words in the text are phonetically regular words and taught spelling patterns. Decodable texts of course should not be driven solely by decodability; they should have a coherent storyline. Decodable texts are typically used as a *transitional* text for beginning readers before students move to authentic connected texts because authentic texts typically include many words that are too challenging and overwhelming for beginning readers. Decodable texts afford opportunities to read and practice taught words in context for accuracy and automaticity, as well as comprehension. Studies have shown that use of decodable texts as part of beginning literacy instruction is beneficial for students' reading development (Cheatham & Allor, 2012; Juel & Roper-Schneider, 1985).

Likewise, opportunities to practice spelling in writing connected texts should be systematically incorporated as part of reading and writing instruction. As students engage in daily writing activities, they should be encouraged to use their learned patterns, try their best spelling (which may be invented spelling), and read their own writing. This provides an opportunity to practice orthographic patterns, spelling, and word reading, and also to engage in meaning-making processes (e.g., comprehension and composition).

Conclusion

There is no doubt that word reading and spelling are the foundational skills for reading and writing development. Word reading and spelling are strongly related and draw on essentially the same skills, namely phonological awareness, orthographic awareness, and morphological awareness. Therefore, these skills should be taught explicitly and systematically. In particular, phonics that includes explicit and systematic teaching of all these aspects should be part and parcel of early literacy instruction. Word reading and spelling are also mutually supportive, and thus, instruction should also capitalize on the synergy between word reading and spelling. Word reading and spelling instruction, like the teaching of any skill, should be built on research-informed pedagogical practices. Last but certainly not least, teaching of word reading and spelling is only *part* of a larger effective early literacy instruction, which also should include explicit and systematic teaching of other skills that are important for reading comprehension and written composition (e.g., vocabulary, listening comprehension, higher order thinking skills).

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