Stages, Phases, Repertoires, and Waves: Learning to Spell and Read Words

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Different sources of information contribute to the logic of English spelling, but why, when, and how should teachers emphasize these different sources in guiding students learning to spell and read words?

How do our students learn to spell and read words? The very order in the wording of this question reflects the research into these processes over the last several decades. The International Literacy Association's (ILA; 2019) literacy leadership brief *Teaching and Assessing Spelling (TAS)* accorded spelling the attention it deserves. Specifically, the brief stated that "spelling matters because of the role it plays in successful reading and writing" (p. 2).

This observation is significant and runs counter to the common perception that spelling is merely a convention of writing—and may be less important in the future, given the ubiquity of spell-check and voice recognition software. Spelling, or orthographic, knowledge provides the underlying foundation for the rapid and efficient encoding *and* decoding of words, allowing individuals more room for thinking and planning as they write and read. This message is clearly and powerfully expressed in *TAS*, in which two prominent spelling perspectives, stage theory and repertoire theory, are contrasted.

Although stage theory has been a predominant perspective in spelling research for many years (e.g., Frith, 1985; Henderson & Beers, 1980; Snowling, 1994; Templeton & Bear, 1992/2011) and was the first to describe reading development as a function of orthographic knowledge, repertoire theory and similar alternative theoretical perspectives have emerged in response (e.g., Adoniou, 2014; Apel, Masterson, & Hart, 2004; Daffern, Mackenzie, & Hemmings, 2015). These perspectives have generated debate about the nature of developmental word knowledge and the nature and timing of instruction that may best facilitate this development.

This debate is important. As presented in *TAS*, however, aspects of stage theory, as well as instruction based on that theory, are not fully representative and are in some instances incorrect. The brief concluded that teachers should "Consider using a repertoire theory approach to teaching spelling, which incorporates a range of spelling knowledge, instead of focusing on a stage theory approach, which addresses skills in a hierarchical manner" (ILA, 2019, p. 15). Because of the importance and prominence of this publication, its dismissal of stage theory is unfortunate. The primary purpose of this article, therefore, is to provide a closer, clarifying look at stage theory in the context of questions that *TAS* and other alternative theorists have raised as to its research rationale and its instructional implications. In so doing, the contributions of *both* stage and repertoire/alternative theories to the common goal of providing more effective and engaging word study will be addressed.

Commonalities and Differences

Stage theory, repertoire theory, and other alternative theories are in agreement on what is to be learned; specifically, they agree on how these three layers of information are represented in the spelling system of English and how this representation is more logical than is commonly assumed:

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1. *Phonological:* Sound
2. *Pattern:* Groups of letters function as a unit to represent sound
3. *Morphological:* The morphemes, or meaning elements, from which words are constructed

To support learning these three layers, these three additional sources of information come into play:

1. *Visual:* Storing words and their spellings in memory
2. *Semantic:* The meanings of words
3. *Etymological:* Word origins and histories

Apparent differences arise, however, between stage and alternative theories regarding when, and to what degree, these types of information are learned. Stage theory holds that "children internalize orthographic [spelling] features in a hierarchical, developmental progression…with the result that they tend to master specific spelling features in a predictable order" (Ford, Invernizzi, & Huang, 2018, p. 1064). In contrast, as presented in *TAS*, the "repertoire theory approach to teaching spelling…incorporates a range of spelling knowledge" (ILA, 2019, p. 15). Rather than a hierarchical progression, repertoire theory holds that the acquisition of spelling skills occurs "concurrently… all children of all ages make use of multiple sources of linguistic knowledge when attempting to spell words… skills learned in one context, or one word, are able to be applied to another" (Adoniou, 2014, p. 147).

Other alternative spelling theories reflect repertoire's perspective to various degrees: for example, overlapping waves (Kwong & Varnhagen, 2005), multiple linguistic repertoire (Apel et al., 2004), conjoint (Bahr, Silliman, & Berninger, 2009), integration of multiple patterns (Treiman & Kessler, 2014), and triple-word form (Daffern et al., 2015). Reconciling this debate between a hierarchical, developmental acquisition and a concurrent acquisition has important implications for instruction.

Development and Insights of Stage Theory

Prior to the 1960s, most spelling research reflected a belief that "English spelling is at best an imperfect attempt to represent sounds thus requiring pedagogical enforcement through brute memorization" (Templeton & Morris, 2000, p. 525). This research counted and cataloged types of spelling errors such as omission of silent letters and failure to double consonants. Stage theory, grounded in a conception of English spelling as a more logical system (Chomsky & Halle, 1968; Venezky, 1967), arose out of the attempt to understand the underlying reasons for learners' errors: Upon what sources of information are they drawing? In the context of the developmental and psycholinguistic research in the mid-20th century, stage theory suggested that these errors or approximations reflected conceptual learning rather than attempts at rote memorization. The theory, and the research that drove it, documented learners' acquisition of progressively more complex spelling patterns that represent both sound and meaning (Henderson, 1985; Henderson & Beers, 1980).

The resulting hierarchical, developmental progression described by stage theorists evolved from the identification of similar error patterns in learners. These error patterns were based on spelling data across thousands of learners at different grade levels and within different instructional contexts (e.g., Beers, 1980; Gehsmann, Spichtig, & Tousley, 2017; Invernizzi & DeCoster, 2016; Snowling, 1994). This progression was described in terms of stages during which learners are observed to move from emergent literacy behaviors through understanding the function of alphabet, sound, pattern, and morphology in the spelling system. This understanding in turn supports the development of reading fluency, allowing more cognitive resources to be allocated to comprehending and thinking about what is being read (Gehsmann, Spichtig, Pascoe, Ferrara, & Tousley, 2019). Stage theory established the value of examining students' spellings to yield insight into the types of information they are using when they read words. Table 1 presents some of the important types of hierarchical features that stage theory research identified as occurring in a developmental progression. Stage theory helped explain why categorizing errors according to a single type, such as doubled consonants, does not capture the developmental nature underlying each type of error.

PAUSE AND PONDER

■ With increasingly more sophisticated spelling checkers available, why should we bother to teach spelling?

■ What are the differences between stage theory's developmental progression in learning spelling and alternative theory's concurrent learning of spelling?

■ Should students be able to spell all the words they know how to read?

■ Does spelling ability limit the types of information that students may learn about words?

Table 1
Stage Theory: Types of Hierarchical Features That Occur in a Developmental Progression

1. Late emergent and beginning readers and writers approach print primarily in linear terms; attempting to match sound and letters in a sequential, left-to-right fashion, then constructing understanding of consonant and short vowel correspondences, including consonant digraphs and then two-letter consonant blends.

2. Simple, most frequent long vowel patterns (*bike/make/road*) are learned as a foundation for learning position-based and context-dependent spelling patterns, such as *ow/ou* (*how/shout*) and *ch/tch* (*coach/catch*). These vowel and consonant spellings within single words/syllables develop the foundation for the next stage.

3. Consistently spelling correctly the junctures of inflectional endings and base words:
   - short vowel + single consonant = double final consonant (*tapped*)
   - vowel digraph + single consonant = do not double final consonant (*rained*)
   - long vowel + single consonant + final *e* = *e*-drop (*taped*)
   Learning these junctures establishes a firm foundation to support the next stage.

4. Consistent correct spelling of syllable juncture patterns, as in these examples:
   - VC/CV (e.g., *bas/ket*, *rab/bit*)
   - V/CV open (e.g., *hu/man*, *cho/sen*)
   - VC/V closed (e.g., *cab/in*, *fin/ish*)
   These foundations of sound and within- and between-syllable patterns underlie the exploration and consistent spelling in the next stage.

5. Bases and roots that change in pronunciation across derived forms but retain the visual relations that signal similar meaning relations (e.g., comp*e*te/comp*e*titive/comp*e*tition; *judge*/*judic*ial/ad*judic*ate).

Note. C = consonant; V = vowel.

Inappropriate instruction would result if they were addressed as a single type of error. To illustrate, the following four types of consonant doubling reflect progressively more complex sound, pattern, and morphological conditions:

- *sled<u>d</u>ed*: A CVC base to which an inflectional suffix is added
- *la<u>dd</u>er*: Syllable juncture within a single morpheme
- *refer<u>r</u>ed*: Accent on the final CVC syllable in the base (reFER) when the past tense ending is added requires doubling the final *r*, which does not occur, however, in *offered*, because the final syllable in the base is *not* accented (OFfer)
- *ir<u>r</u>ational*: The prefix *in-* assimilated into the base, *rational*, requiring a change in the spelling of the prefix to *ir-*

The Term Stage: Interpretations and Realities

The continuing use of the term *stage*, first applied to spelling development decades ago, has for some alternative theorists connoted a lock-step concept of development with stages that reflect an exclusive focus on one source of information to the exclusion of other sources (ILA, 2019). The research underlying stage theory and the instruction based on that research, however, have shown how different sources—sound, pattern, and meaning—affect learning throughout the course of development.

Stage theorists have described how reading is the pacemaker for spelling (Frith, 1985). By providing orthographic information slightly beyond the learner's current spelling knowledge, reading can facilitate progression from one stage or phase to the next (Bear & Templeton, 2000; Nunes & Bryant, 2009; Templeton & Morris, 2000). "Learners draw from *multiple sources of information* [emphasis added]…the degree to which these different sources are used varies as learning progresses" (Templeton, 2003, p. 744); for example:

- Alphabetic spellers/beginning readers gradually learn to read a number of words with silent *e*, and this pattern begins to influence their spelling. To illustrate, the spelling of "tak" for *take* may become "taek." This phenomenon helps drive development toward within-word pattern understandings that will include conditional relations such as the effect of the silent *e* in a

long vowel pattern and, later, the effect of the vowel sound and spelling on final consonant spellings such as *sketch* versus *screech*.

■ Within-word pattern spellers/transitional readers apply their developing understanding of spelling patterns in single-syllable words to the decoding of two-syllable words in reading. Knowledge of CVC patterns helps students decode the word *happen*, although for a while they may continue to spell it as "hapen." The teacher may point out the doubled consonants and talk about how we need them to "close" the first syllable and keep the short vowel sound, but telling is not always teaching. Learners will usually need additional experience with reading these two-syllable words, which will help drive development toward understanding the conditions that determine the number of consonants at syllable junctures.

Although alternative theorists have criticized stage theory for not acknowledging the role of morphology, or meaning, early in development (ILA, 2019), the theory in fact identified the early role of inflectional morphology (Beers & Henderson, 1977) as revealed in young students' spellings of *-ed* and *-ing*. Stage theory also emphasized, however, how developing an understanding of inflectional morphology involves not only the correct spelling of inflectional endings but also sorting out the conventions that govern their connection to a base or root, understandings that develop later (Schlagal, 1992/2011). Stage theory described how this second step depends on prior knowledge of phonological and orthographic patterns within single syllables. As these examples illustrate, this prior knowledge determines whether the final consonant in a base word is doubled or left alone or whether a final *e* is dropped.

Stage theorists identified and addressed the earlier influence of simple derivational morphology (Henderson, 1985; Henderson & Templeton, 1986)—learning the meaning and effect of affixing common prefixes and suffixes such as *un-*, *re-*, and *-ful* to base words—as well as of transparent Latin and Greek roots (e.g., Templeton & Gehsmann, 2014; Templeton, Johnston, Invernizzi, & Bear, 2019). They also identified and emphasized, however, that the more expansive exploration and application of derivational morphology in spelling occurs later in development, including the sound changes within base words and Latin and Greek roots when suffixes are added (e.g., *cust*o*dy/cust*o*dian*, *original/original*i*ty*,

pugnacious/impugn; Templeton & Scarborough-Franks, 1985). Research by Nagy, Berninger, and Abbott (2006) concluded that the "role of morphology in the writing system [spelling] is grasped later than basic insight that new words can be analyzed as combinations of familiar parts. This pattern is consistent with Bear et al.'s (2004) developmental approach to spelling" (pp. 144–145).

Alternative theorists have criticized stage theory for not addressing the role of different strategies in early learning, suggesting that the theory focuses exclusively on an alphabetic strategy to the exclusion of, for example, analogy, memory, and rules. Again, stage theorists have addressed this issue, noting that the developmental progression "involves complex processes in which *a number of different strategies* [emphasis added] are called upon throughout the learning process" (Templeton & Morris, 1999, p. 105). These include, for example, sounding out, reasoning by analogy from one word's spelling to another, and applying a generalization (Bear, Invernizzi, Templeton, & Johnston, 2020; Templeton & Morris, 1999).

Another developmental theorist, Ehri (1997, 1992/2011, 2014), used the terms *level* and *phase* rather than *stage*, emphasizing how each phase reflects the "key capability that distinguishes among the levels and underlies development. Each level characterizes the approach that predominates at that level" (1997, p. 253). She emphasized that, rather than an *exclusive* focus on sound early in development, for example, children's attempts to understand how sound corresponded to print was the predominant approach. "This predominant type of orthographic connection," Ehri concluded, "changes with development" (2014, p. 10). As had the spelling stage theorists, her developmental model described developmental changes predominantly, although not exclusively, from sound to pattern to morphology.

Stage and Repertoire Theories: A Clarifying Summary

For many years, stage theory has been a significant theoretical stance in spelling research and instruction. It has evolved from being not just a theory of how students learn to spell words but a theory describing how they learn to read words, revealing how the same underlying orthographic knowledge supports both the encoding and decoding of words.

As stage theorists have long noted, although all sources of information—sound, pattern, and

meaning—may be present at any point in development, learners consistently demonstrate productive understanding of certain types of informational threads, and segments within each thread, before others. By focusing on the predominant source of information the student is attempting to negotiate when spelling words, stage theorists have provided insight into effectively differentiating instruction according to learners' development on the one hand and the complexity of the spelling system on the other; as Invernizzi and Hayes (2011) summarized, "*when* to teach *what* to *whom*" (p. 205). Although maintaining that "all the spelling knowledge threads are useful at all grades," repertoire theory also observes that "we may expect some to dominate at certain grades" (ILA, 2019, p. 9).

Clarifying this distinction between the predominant focus of learners and an exclusive focus helps bridge the misunderstanding between alternative and stage theorists. A number of alternative theories have in fact found common ground with stage theory. Their research has demonstrated how knowledge within each thread develops from simple to more complex features (Bourassa & Treiman, 2008). Also, once it is clear that stage theories have long acknowledged the influence of several sources of information and strategies throughout development, the theoretical debate appears less adversarial and more complementary.

Regardless of the labels that may be used to describe spelling development—stage, phase, repertoire, waves, integration of multiple patterns, and so forth—in the final analysis, the acquisition of orthographic knowledge still follows a developmental trajectory, reflecting the increasing complexity of the spelling system itself (Templeton & Bear, 2018). The farther along this trajectory learners move, the more threads from within each source of information they can draw to construct their understanding and to apply strategies.

Stage and Repertoire Theories: Reconciling Instructional Perspectives

How might stage theory's developmentally based instruction accommodate repertoire theory's emphasis that "spelling pedagogy must pay attention to all of those threads" (ILA, 2019, p. 9), or sources of information? It does so by informing and balancing how much attention should be paid to each thread throughout development.

In fact, both theoretical perspectives can be reconciled through emphasizing how effective word study instruction addresses not only spelling but also its integration with word analysis and vocabulary instruction (Bear et al., 2020; Devonshire, Morris, & Fluck, 2013; Schlagal, 2013). Word study establishes a balance among the different sources of information in terms of time and emphasis among encoding, decoding, and vocabulary instruction and activities across the grades, while supporting students' active involvement in the exploration of the logic of the spelling system.

One type of engagement through which students are actively involved is the categorizing or sorting of words. Engaging students in these focused contrasts (Bear et al., 2020) is supported by both stage and alternative theories (Apel et al., 2004). Building on basic educational psychology—the effectiveness of comparing and contrasting—it is a particularly effective approach in facilitating learners' insights and understandings about how the spelling system represents sound, pattern, and meaning. It has long been a mainstay of classroom and intervention practice (e.g., Botel, 1964). Cartwright (2012) emphasized sorting activities as a way for educators to "provide multiple opportunities to think and talk about both sounds and meanings to foster children's flexible thinking about these elements of print" (p. 33).

The instructional balance among different sources of information is informed in part by the span that develops between learning to read words and eventually to spell those words correctly (Ahmed, Wagner, & Lopez, 2014; Morris, 2011; Templeton & Bear, 1992/2011). This span illustrates the basic psychological principle involving recognition and production: In any type of learning, correct recognition precedes correct production. Stage theory's emphasis on this principle explains why and how the differentiation among encoding, decoding, and vocabulary instruction is established.

Let's consider some examples of how this attention among different threads or sources of knowledge is allocated:

- Emergent learners may be led to an awareness of spoken words as units by taking two "short," concrete words and making them into one "long" compound word (e.g., *rain*, *coat*, *raincoat*). "Although the emphasis in building phonological sensitivity is on the sounds of words, *there can be a productive interplay between sound and*

meaning [emphasis added]" (Bear, Invernizzi, Templeton, & Johnston, 2016, p. 106).

- To support beginning readers and writers in developing a flexible perspective in thinking about words and their spelling, students may sort the same group of words three ways: first, by vowel sounds; second, by consonant digraphs or blends; third, by meaning categories, such as action versus things (e.g., *crash*, *drag*, *trim* vs. *crumb*, *truck*, *crib*; Bear et al., 2020).

- Some alternative theorists have described a greater role for etymology in early spelling instruction (e.g., Adoniou, 2016; Bowers & Bowers, 2017; Devonshire et al., 2013), and their suggestions are valuable. For younger students, attention to etymology can help explain apparent exceptions and irregularities at the phonological and orthographic levels. For example:

  - Grouping *two*, *twice*, *twelve*, and *twenty* together explains the *w* in *two*; grouping *do*, *does*, *done*, and *don't* together reveals the meaning relations they share despite the different pronunciations of *do*.

  - Grouping words in which the "magic *e*" rule does not apply will reveal one important category: in words such as *have*, *love*, and *give*, students realize that English words cannot end with the letter *v*! Long ago, if *v* were doubled to mark the short vowel, it would have looked like a *w*, so the practice of adding an *e* became popular (Johnston, 2000).

Although this source will not receive as much attention as sound-based instruction in beginning spelling and phonics, nonetheless, these few examples help students become aware of the important *process* of etymology. This explicit awareness supports the mind-set that there is a logic to the system of English spelling, one that explains what on the surface appear to be exceptions and irregularities (Adoniou, 2014; Daffern & Critten, 2019).

- Vocabulary instruction in the primary grades may include some attention to more advanced derivationally related words, noting semantic relations (although not expecting correct spelling for such words), such as *mine/mineral*, *geology/geologist/geological* (Freeman, Townsend, & Templeton, 2019).

- Knowledge of the developmental relations among spelling, reading, and vocabulary helps teachers make the appropriate developmental

decision when younger learners occasionally spell correctly, or are attempting to spell, words that reflect more advanced spelling features. For example, the student who writes "My older sister totaly agruvates me!" will benefit from the following:

  - Investigating *some* syllable juncture spelling patterns—when to double when adding suffixes, as in *totally*; but

  - Not *all* syllable juncture patterns—the doubled consonants in *aggravate* that signal an assimilated prefix (although the teacher may provide the correct spelling)

  - The teacher possibly mentioning assimilated prefixes, as part of vocabulary instruction—but again, expecting correct spelling to follow is not well advised

- As they are exploring syllable juncture patterns through focused contrasts in words such as *button*, *happy* versus *bacon*, *lazy* to develop the spelling generalization about whether or not to double consonants at syllable junctures, students may also learn the following:

  - The generative vocabulary meaning patterns in Greek and Latin roots in words such as *transcription*, *barometric*, and *autobiographical*

  - How these meaning patterns form the majority of general academic and domain-specific vocabulary and lay the foundation for learning the correct spellings of longer, more morphologically complex words a bit later in an instructional sequence (Templeton, 2011, 2012)

- Some alternative theorists observed that instruction in etymology should also include pointing out relations among words such as *sign*, *signal*, and *signature* (Devonshire & Fluck, 2010). Although etymology indeed explains the origin of these relations—the Latin root *signum*—most of the research community as well as stage theory refer to these meaningful relations as part of derivational morphology. This is a minor definitional point, but it matters because some repertoire theorists conclude that stage theory considers work on etymology to "simply be left as extension work for advanced learners" (ILA, 2019, p. 9). A closer look at stage theory instruction affirms that the types and sequence of these relations are addressed extensively in the domain of derivational morphology (Ganske, 2008; Templeton et

al., 2019), through instruction that alternative theorists would also support. For example:

- The fuller range of advanced derivational relations, for most students in the upper elementary and middle grades, may be explored beginning with words such as *athlete/athletic* and *ignite/ignition*, moving then to words in which the spelling of the challenging schwa sound is revealed in a related word, such as *comp_o_sition/comp_o_se* and *opp_o_sition/opp_o_se*.

- The more at-first-glance "opaque" relations among roots and affixes in terms of spelling and meaning may be explored in depth, as in the case of the root *pos*, meaning "put, place." In *compose*, we are "putting *together* [*com-*]," but in *oppose*, we are "putting *against* [*ob-*]." (The spelling of the prefix *ob-* becomes assimilated.)

Conclusion

Much of the debate between stage and repertoire/alternative theories may be resolved when it is clear that stage theory (a) does not connote lock-step, distinct, and exclusionary stages and (b) identifies and emphasizes the predominant, but not the only, source of information from which learners may draw.

Theory matters in guiding young students as they learn how to spell and read words. *TAS* noted that, to learn to spell, "reading in itself is not enough exposure for most people. We need to pay attention to words, their components" (ILA, 2019, p. 8). Suggesting, however, that teachers base instruction solely on repertoire theory to the exclusion of the insights revealed by stage theory, as *TAS* did, would deprive teachers of the important criteria that stage theory has established for identifying which words and sources of information it will be most beneficial to attend, and when, for purposes of learning correct spelling, analyzing or decoding words, and expanding vocabulary.

Considered as complementary perspectives, in contrast, as I have attempted to establish in this article, both stage and repertoire/alternative theories offer important instructional implications. Both perspectives generate instruction that can motivate learners and lead them toward a much more informed understanding of the logic underlying English orthography, as well as how to apply that understanding across all aspects of word learning.

TAKE ACTION!

1. Examine your mandated reading/language arts curriculum. To what extent does it reflect a strong sequence of progressively more complex spelling patterns—in encoding, decoding, and vocabulary instruction?

2. Using the appropriate references and the resources in the More to Explore sidebar at the end of this article as a guide:

   - If you have not tried sorting activities but would like to begin using them, start with a small group of your students who are similar in their level of spelling development. Your students—and you!—will learn and become comfortable with the structure, questions, and discussion characteristic of sorting.

   - Compare your own word study instruction with the progression and activities presented in this article. What are you already including in your teaching? What would you like to focus on and include more of in your classroom? For example, you might explore how vowel spellings are determined by position; syllable juncture patterns; spelling–meaning connections; Latin and Greek word roots; or etymology in the primary or intermediate grades.
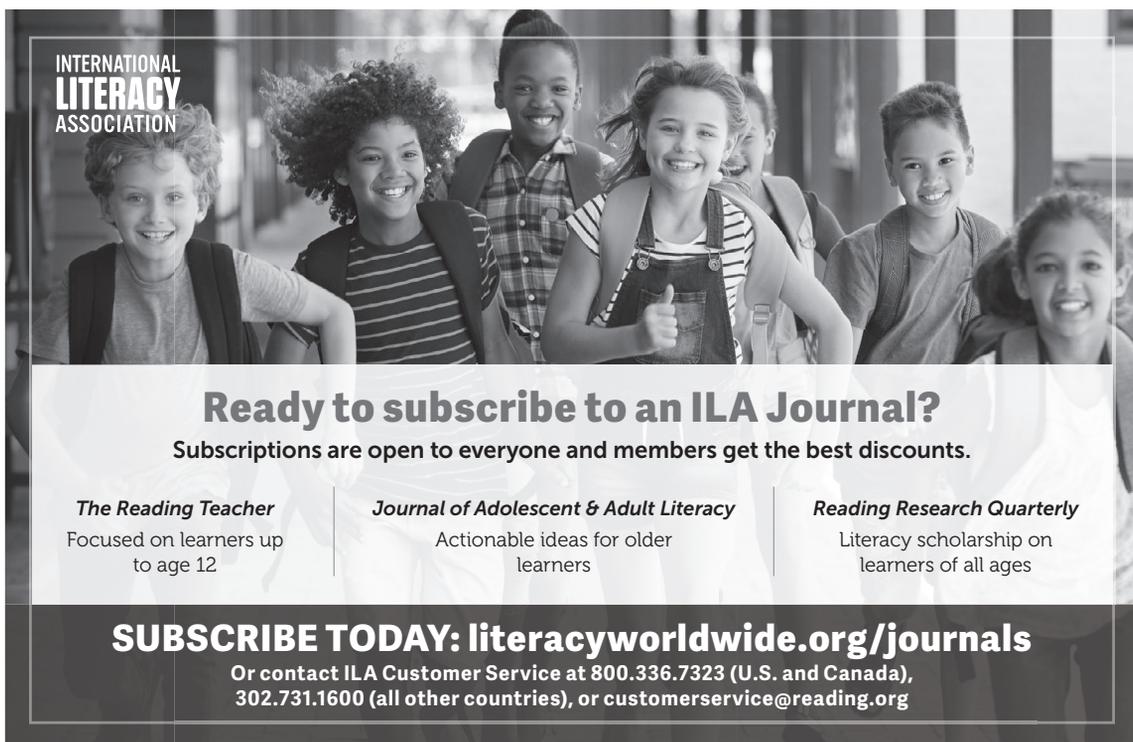
REFERENCES

Adoniou, M. (2014). What should teachers know about spelling? *Literacy*, 48(3), 144–154. https://doi.org/10.1111/lit.12017

Adoniou, M. (2016). *Spelling it out: How words work and how to teach them*. Cambridge, UK: Cambridge University Press.

Ahmed, Y., Wagner, R.K., & Lopez, D. (2014). Developmental relations between reading and writing at the word, sentence, and text levels: A latent change score analysis. *Journal of Educational Psychology*, 106(2), 419–434. https://doi.org/10.1037/a0035692

Apel, K., Masterson, J., & Hart, P. (2004). Integration of language components in spelling. In L. Wilkinson & E. Silliman (Eds.), *Language and literacy learning in schools* (pp. 292–318). New York, NY: Guilford.

Bahr, R.H., Silliman, E.R., & Berninger, V. (2009). What spelling errors have to tell about vocabulary learning. In C. Wood & V. Connelly (Eds.), *Contemporary perspectives on reading and spelling* (pp. 109–129). London, UK: Routledge.

Bear, D.R., & Templeton, S. (2000). Matching development and instruction. In N. Padak & T. Rasinski (Eds.), *Distinguished educators on reading: Contributions that have shaped effective literacy instruction* (pp. 363–376). Newark, DE: International Reading Association.

Bear, D.R., Invernizzi, M., Templeton, S., & Johnston, F. (2016). *Words their way: Word study for phonics, vocabulary, and spelling instruction* (6th ed.). Boston, MA: Pearson.

Bear, D.R., Invernizzi, M., Templeton, S., & Johnston, F. (2020). *Words their way: Word study for phonics, vocabulary, and spelling instruction* (7th ed.). Boston, MA: Pearson.

Beers, J.W. (1980). Developmental strategies of spelling competence in primary school children. In J.W. Beers & E.H. Henderson (Eds.), *Developmental and cognitive aspects of learning to spell* (pp. 36–45). Newark, DE: International Reading Association.

Beers, J.W., & Henderson, E.H. (1977). A study of developing orthographic concepts among first graders. *Research in the Teaching of English*, 11(2), 133–148.

Botel, M. (1964). What linguistics says to this teacher of reading and spelling. *The Reading Teacher*, 18(3), 188–193.

Bourassa, D.C., & Treiman, R. (2008). Morphological constancy in spelling: A comparison of children with dyslexia and typically developing children. *Dyslexia*, 14(3), 155–169. https://doi.org/10.1002/dys.368

Bowers, J.S., & Bowers, P.N. (2017). Beyond phonics: The case for teaching children the logic of the English spelling system. *Educational Psychologist*, 52(2), 124–141. https://doi.org/10.1080/00461520.2017.1288571

Cartwright, K.B. (2012). Insights from cognitive neuroscience: The importance of executive function for early reading development and education. *Early Education and Development*, 23(1), 24–36. https://doi.org/10.1080/10409289.2011.615025

Chomsky, N., & Halle, M. (1968). *The sound pattern of English*. New York, NY: Harper & Row.

Daffern, T., & Critten, S. (2019). Student and teacher perspectives on spelling. *Australian Journal of Language and Literacy*, 42(1), 40–57.

Daffern, T., Mackenzie, N.M., & Hemmings, B. (2015). The development of a spelling assessment tool informed by triple word form theory. *Australian Journal of Language and Literacy*, 38(2), 72–82.

Devonshire, V., & Fluck, M. (2010). Spelling development: Fine-tuning strategy-use and capitalising on the connections between words. *Learning and Instruction*, 20(5), 361–371. https://doi.org/10.1016/j.learninstruc.2009.02.025

Devonshire, V., Morris, P., & Fluck, M. (2013). Spelling and reading development: The effect of teaching children multiple levels of representation in their orthography. *Learning and Instruction*, 25, 85–94. https://doi.org/10.1016/j.learninstruc.2012.11.007

Ehri, L.C. (1997). Learning to read and learning to spell are one and the same, almost. In C.A. Perfetti, L. Rieben, & M. Fayol (Eds.), *Learning to spell: Research, theory, and practice across languages* (pp. 237–269). Mahwah, NJ: Erlbaum.

Ehri, L.C. (2011). Review and commentary: Stages of spelling development. In S. Templeton & D.R. Bear (Eds.), *Development of orthographic knowledge and the foundations of literacy: A memorial festschrift for Edmund H. Henderson* (pp. 307–332). New York, NY: Routledge. (Original work published 1992)

Ehri, L.C. (2014). Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading*, 18(1), 5–21. https://doi.org/10.1080/10888438.2013.819356

Ford, K., Invernizzi, M., & Huang, F. (2018). The effect of orthographic complexity on Spanish spelling in grades 1–3. *Reading and Writing*, 31, 1063–1081. https://doi.org/10.1007/s11145-018-9828-7

Freeman, N.D., Townsend, D., & Templeton, S. (2019). Thinking about words: First graders' response to morphological instruction. *The Reading Teacher*, 72(4), 463–473. https://doi.org/10.1002/trtr.1749

Frith, U. (1985). Beneath the surface of developmental dyslexia. In K. Patterson, J. Marshall, & M. Coltheart (Eds.), *Surface dyslexia: Neuropsychological and cognitive studies of phonological reading* (pp. 301–330). London, UK: Erlbaum.

Ganske, K. (2008). *Mindful of words: Spelling and vocabulary explorations 4–8*. New York, NY: Guilford.

Gehsmann, K., Spichtig, A., Pascoe, J., Ferrara, J., & Tousley, E. (2019, July). *The confluence of orthographic knowledge and reading efficiency in proficient and non-proficient fourth- and fifth-grade readers*. Paper presented at the 26th annual meeting of the Society for the Scientific Study of Reading, Toronto, ON, Canada.

Gehsmann, K., Spichtig, A., & Tousley, E. (2017). Validating an online assessment of developmental spelling in grades 5–8. *Literacy Research: Theory, Method, and Practice*, 66(1), 279–292.

Henderson, E.H. (1985). *Teaching spelling*. Boston, MA: Houghton Mifflin.

Henderson, E.H., & Beers, J. (Eds.). (1980). *Developmental and cognitive aspects of learning to spell: A reflection of word knowledge*. Newark, DE: International Reading Association.

Henderson, E.H., & Templeton, S. (1986). A developmental perspective of formal spelling instruction through alphabet, pattern, and meaning. *The Elementary School Journal*, 86(3), 305–316. https://doi.org/10.1086/461451

International Literacy Association. (2019). *Teaching and assessing spelling* [Literacy leadership brief]. Newark, DE: Author. Retrieved from https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-teaching-and-assessing-spelling.pdf

Invernizzi, M., & DeCoster, J. (2016). *Report of annual PALS screening results for Virginia's Early Intervention Reading Initiative (EIRI): 2015–2016*. Technical report prepared for the Virginia Department of Education.

Invernizzi, M., & Hayes, L. (2011). Developmental patterns of reading proficiency and reading difficulties. In A. McGill-Franzen & R.L. Allington (Eds.), *Handbook of reading disability research* (pp. 196–207). New York, NY: Routledge.

Johnston, F.R. (2000). Spelling exceptions: Problems or possibilities? *The Reading Teacher*, 154(4), 372–378.

Kwong, T.E., & Varnhagen, C.K. (2005). Strategy development and learning to spell new words: Generalization of a process. *Developmental Psychology*, 41(1), 148–159. https://doi.org/10.1037/0012-1649.41.1.148

Morris, D. (2011). Interventions to develop phonological and orthographic systems. In A. McGill-Franzen & R.L. Allington (Eds.), *Handbook of reading disability research* (pp. 279–288). New York, NY: Routledge.

Nagy, W., Berninger, V.W., & Abbott, R.D. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology*, 98(1), 134–147. https://doi.org/10.1037/0022-0663.98.1.134

Nunes, T., & Bryant, P. (2009). *Children's reading and spelling: Beyond the first steps*. Chichester, UK: Wiley-Blackwell.

Schlagal, R. (2011). Patterns of orthographic development into the intermediate grades. In S. Templeton & D.R. Bear (Eds.), *Development of orthographic knowledge and the foundations of literacy: A memorial Festschrift for Edmund H. Henderson* (pp. 31–52). New York, NY: Routledge. (Original work published 1992)

Schlagal, R. (2013). Best practices in spelling and handwriting. In S. Graham, C.A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (2nd ed., pp. 257–283). New York, NY: Guilford.

Snowling, M.J. (1994). Towards a model of spelling acquisition: The development of some component skills. In G.D.A. Brown & N.C. Ellis (Eds.), *Handbook of spelling: Theory, process, and intervention* (pp. 111–128). Chichester, UK: John Wiley & Sons.

Templeton, S. (2003). Spelling. In J. Flood, D. Lapp, J.R. Squire, & J.M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (2nd ed., pp. 738–751). Mahwah, NJ: Erlbaum.

Templeton, S. (2011). Teaching and learning morphology: A reflection on generative vocabulary instruction. *Journal of Education*, 192(2/3), 101–107.

Templeton, S. (2012). The vocabulary–spelling connection and generative instruction: Orthographic development and morphological knowledge at the intermediate grades and beyond. In J.F. Baumann & E.J. Kame'enui (Eds.), *Vocabulary instruction: Research to practice* (2nd ed., pp. 116–138). New York, NY: Guilford.

Templeton, S., & Bear, D.R. (Eds.). (2011). *Development of orthographic knowledge and the foundations of literacy: A memorial festschrift for Edmund H. Henderson.* New York, NY: Routledge. (Original work published 1992).

Templeton, S., & Bear, D.R. (2018). Word study, research to practice: Spelling, phonics, meaning. In D. Lapp & D. Fisher (Eds.), *Handbook of research on teaching the English language arts* (4th ed., pp. 207–232). New York, NY: Routledge.

Templeton, S., & Gehsmann, K. (2014). *Teaching reading and writing: The developmental approach (preK–8).* Boston, MA: Pearson.

Templeton, S., Johnston, F., Invernizzi, M., & Bear, D.R. (2019). *Words their way: Word sorts for derivational relations spellers* (3rd ed.). New York, NY: Pearson.

Templeton, S., & Morris, D. (1999). Questions teachers ask about spelling. *Reading Research Quarterly*, 34(1), 102–112. https://doi.org/10.1598/RRQ.34.1.6

Templeton, S., & Morris, D. (2000). Spelling. In M. Kamil, P. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 525–543). Mahwah, NJ: Erlbaum.

Templeton, S., & Scarborough-Franks, L. (1985). The spelling's the thing: Knowledge of derivational morphology in orthography and phonology among older students. *Applied Psycholinguistics*, 6(4), 371–389. https://doi.org/10.1017/S0142716400006317

Treiman, R., & Kessler, B. (2014). *How children learn to write words.* New York, NY: Oxford University Press.

Venezky, R.L. (1967). English orthography: Its graphical structure and its relation to sound. *Reading Research Quarterly*, 2(3), 75–105. https://doi.org/10.2307/747031

MORE TO EXPLORE

- Bloodgood, J.W., & Pacifici, L.C. (2004). Bringing word study to intermediate classrooms. *The Reading Teacher*, 58(3), 250–263. https://doi.org/10.1598/RT.58.3.3

- Flanigan, K., & Hayes, L. (2014). *Developing word recognition.* New York, NY: Guilford.

- Ganske, K. (2016). SAIL: A framework for promoting next-generation word study. *The Reading Teacher*, 70(3), 337–346. https://doi.org/10.1002/trtr.1529

- Johnston, F., Invernizzi, M., Bear, D.R., & Templeton, S. (2014). *Words their way for preK–K.* Boston, MA: Pearson.

- Templeton, S., Bear, D.R., Invernizzi, M., Johnston, F., Flanigan, K., Townsend, D.R., … Hayes, L. (2015). *Words their way: Vocabulary for middle and secondary students* (2nd ed.). Boston, MA: Pearson.

- Williams, C., Phillips-Birdsong, C., Hufnagel, K., Hungler, D., & Lundstrom, R.P. (2009). Word study instruction in the K–2 classroom. *The Reading Teacher*, 62(7), 570–578. https://doi.org/10.1598/RT.62.7.3

- Online Etymology Dictionary: https://www.etymonline.com (to explore etymology of specific words)