Rethinking Sight Words

Katharine Pace Miles, Gregory B. Rubin, Selenid Gonzalez-Frey

The authors present a manageable and effective way to categorize lists of sight words, as well as a quick and easy instructional method for helping students secure these words in memory.

You are a proficient reader. Therefore, you are most likely reading the words you see here automatically, by sight. Sight word reading is the fastest and most efficient way to read words. Decoding (sounding out letter by letter), analogizing (if you can read *table*, you can read *gable*), and predicting (relying on context clues) are slower methods, generally used only when encountering unfamiliar words or while learning to read. Proficient readers rely on their abundant sight word knowledge to read words fluently, which allows their mental energy to be spent on comprehending what they are reading (Ehri, 2014). The path by which sight words become stored in memory has been widely demonstrated in the reading science literature: visual–phonological links are made between the spelling of a word and its pronunciation, and repeated encounters with the word help cement it in the reader's mind (Ehri, 1992, 1998, 2005, 2014; Jorm & Share, 1983; Share, 2008). Yet, there seems to be a disconnect between the demonstrated influence of attending to a word's grapheme–phoneme relations and the prevailing approach to teaching sight words, which deemphasizes these relations in favor of whole-word memorization.

Two Definitions of Sight Word Learning

Ehri (1998) explained that there are two definitions of sight word learning. One refers to an instructional practice in which students are given word lists or flashcards to repeatedly read. Beginning readers spend time practicing the words on these lists to read them automatically, or by sight. The other definition refers to a process by which the brain acquires information about a word's identity to securely store it in memory so that it may be accessed quickly when the reader is presented with the print version of the word. This process of storing the spelling, pronunciation, and meaning of a word is referred to as sight word learning. These two definitions evoke two very different forms of word learning. The first is based on repetition and whole-word storage; the second is based on analysis and storage of grapheme–phoneme relations to secure the spelling and pronunciation of the word in memory, along with the word's meaning.

Ehri's (1992, 2005) connectionist theory states that words are most efficiently stored when visual–phonological connections are established between the spelling and pronunciation of words. Through the process of taking the print version of a word and pronouncing it, orthographic information about the word is stored. This process is referred to as orthographic mapping. The self-teaching hypothesis (Jorm & Share, 1983; Share, 2004, 2008) suggests that even though there is not explicit instruction on grapheme–phoneme relations when words are read, this information may be stored regardless.

Similar theories (Perfetti & Hart, 2002; Rack, Hulme, Snowling, & Wightman, 1994), as well as empirical studies on reading words in isolation, all suggest that while students are being repeatedly exposed to unknown words, implicit grapheme–phoneme knowledge is being acquired. However, this assumption runs contrary to messages that students may be receiving about how to read these words. Suggestions that these words should not or cannot be sounded out, as subsequently discussed, draw students' attention away from the grapheme–phoneme relations in the word.

Katharine Pace Miles is an assistant professor of early childhood education at Brooklyn College, NY, USA; e-mail kpmiles@brooklyn.cuny.edu.
Gregory B. Rubin is a master's student at Brooklyn College, NY, USA; e-mail gregory.b.rubin@gmail.com.
Selenid Gonzalez-Frey is a doctoral student at the Graduate Center of the City University of New York, NY, USA; e-mail sgonzalez21@gmail.com.

 doi:10.1002/trtr.1658

One kindergarten teacher gave an example of a student with some mastery of one-to-one letter–sound correspondences who was struggling to secure the word *see* in memory despite repeated exposures. Instead of using the grapheme clues in the word, the student closed his eyes and tapped his forehead three times while he said, "*A*, *b*, *c*…it's *see*!" Although this was a clever mnemonic, or memory support, for the word *see* because the letter name is pronounced like the word, it is obviously an inefficient process for storing a representation of the word in memory, as there is no logical link between the visual representation of the word *see* and the letter *c* (Ehri & Roberts, 2006). It was no surprise that when asked how this student was progressing with his mastery of the class sight word list, the teacher reported that he was not doing well.

PAUSE AND PONDER

- How do you teach students to read high-frequency words/sight words? Do you use a whole-word approach, or do you capitalize on letter–sound relations to help secure the word in memory?
- Is your method for teaching these words effective? Are all of your students experiencing success with reading and spelling these words? Does it take some students an inordinate amount of time and effort to remember these words?
- Do you find that some students rely heavily on supports around the classroom, such as word walls or word lists, to learn these words?
- What strategies do your students use to read unfamiliar words that they encounter in a text?

For some students who struggle to secure high-frequency words (i.e., sight words, words that are included on lists of the most commonly used words in English text) in memory, instruction on reading these words without using grapheme–phoneme cues could arguably lead to situations such as the one just described, where students are using other, far less reliable information or memory tricks. Although this student was most likely in Ehri's (2014) partial alphabetic phase of reading, in which beginning readers use the most salient sounds and letters in the words to read and spell words, he appeared to be employing a regressive reading strategy more commonly associated with Ehri's pre-alphabetic phase, in which readers rely on the word's shape or environmental context to read the word. The student possessed some letter–sound knowledge that he could capitalize on; considering that this was the end of kindergarten, letter sounds had been repeatedly taught; and he had demonstrated partial mastery of one-to-one letter–sound correspondences. However, without instruction that encouraged him to use this information, he chose another, more dubious memory cue.

Young readers eventually transition into the full alphabetic phase, where they are able to use all of the grapheme–phoneme information in a word to pronounce it and can provide complete phonetic representations of each sound in the word when spelling it (Ehri, 2014). In the final, consolidated alphabetic phase, students are able to rely on graphosyllabic connections (i.e., letter–syllable representations such as *-cred*, *-tion*, *-dle*) and demonstrate proficient memory for correct spelling conventions (Ehri, 2014).

In kindergarten, most students are in the partial alphabetic or full alphabetic phase. Students in the partial alphabetic phase, who lack sufficient knowledge of grapheme–phoneme relations, may be less able to secure high-frequency/sight words in memory via repeated exposure on flashcards, on word lists, or in context, all of which are standard sight word teaching methods in kindergarten classrooms. Miles (2015) assessed kindergartners' ability to learn to read words on flashcards and embedded in context. Results indicated that partial alphabetic readers performed significantly worse than full alphabetic readers on a test of orthographic mapping (matching letters to the sound unit in a word), as well as reading and spelling target words, regardless of whether they read the words on flashcards or in context.

These results suggest that it is important to consider that all students in the same class may not benefit from learning words on flashcards in a repeated, whole-word fashion or by reading words in context multiple times. More specifically, these results demonstrated that this task of reading words on flashcards did not close the gap between partial alphabetic and full alphabetic phase readers in kindergarten, a critical time to ensure that all students are off to a strong start with their word recognition skills. It may be that partial alphabetic readers are not able to benefit from this instructional practice until they have acquired more knowledge about grapheme–phoneme relations.

Sight Word Learning in Schools

Sight word learning is a prevalent focus in elementary schools. Most schools are committed to one of various high-frequency/sight word lists: Dolch, Fry, or

curriculum-generated lists from programs such as the Teachers College Reading and Writing Project (TCRWP). Even reading programs that are committed to teaching students grapheme–phoneme relations have such word lists. For example, the Orton-Gillingham program has a list of Red Flag Words, and the Lindamood-Bell program comes with its Star Word List of the 1,000 most commonly used words in English. Although the intention of some published word lists is to have students practice the words as whole units, either by repeatedly reading sections of the word lists or practicing reading the words on flashcards, this may not be the intention of other word list publishers. The reality, however, is that sight word lists are often used in this manner, and students are assessed on the number of words they are able to read automatically.

Conversations with kindergarten teachers who use word lists have confirmed this supposition. One teacher who uses the Fry word list with her students commented that these words were to be read in an instant, and students were instructed not to try to decode the words. Another kindergarten teacher stated that the words from the TCRWP word list were called "snap words" because they were to be read in a snap, and she indicated that the words were presented, practiced on flashcards, and then placed on a word wall. A third kindergarten learning specialist referred to the school's word list as "popcorn words" because the words were supposed to pop out of a student's mouth. Teachers in this school had students practice by passing around a fishbowl with the words in it. If the student picked a word and said it immediately, he or she kept the word as the equivalent of a point; if the word did not pop right out of the student's mouth, the word went back in the bowl.

The message that some teachers are receiving (or perhaps inferring) from word list manufacturers, and therefore conveying to their students, is that these are words that should not or cannot be decoded or that the words do not necessarily need to be decoded to be stored in memory. This is problematic considering the large body of evidence that words are best secured in memory when attention is given to grapheme–phoneme relations.

Grapheme–Phoneme Instruction Supports Learning New Words

Several studies have demonstrated that training in phonemic awareness and grapheme–phoneme relations improves word reading ability. Boyer and Ehri (2011) showed that preschoolers trained to segment words into phonemes using letter tiles performed better than a control group on measures of nonword reading and spelling, with the group that was trained in phoneme segmentation using letter tiles and pictures of articulatory gestures (i.e., cards with a drawing of a mouth making a specific single sound) performing better than both the control and letters-only groups.

Uhry and Shepherd (1997) trained first and second graders in a combined letter–sound and phonemic awareness training with phonics-controlled and narrative-controlled text reading. In addition, during the expressive writing portion of the training, students were encouraged to construct invented spellings by segmenting phonemes and representing them with letters learned during training. Results demonstrated that improvement in phonemic awareness and spelling corresponded with significant gains in reading sight words and nonwords.

Stuart, Masterson, and Dixon (2000) directed students' attention to target words embedded in experimenter-created books. The target words were printed in red; during the first two encounters with the words, the experimenter drew students' attention to the initial letter in each word. Results showed that students with stronger graphophonemic and letter knowledge performed significantly better on sight word reading. Interestingly, among students with poor graphophonemic skills, there was a significant correlation between visual memory scores, as measured by students' ability to memorize and reproduce a sequence of Greek letters, and word learning after 36 trials. However, among students with strong graphophonemic skills, there was no such correlation. This suggests that visual memory was employed as a means of word learning primarily by students who were unable to rely on graphophonemic relations, a far more effective strategy, to remember the words.

In a similar vein, studies have demonstrated that instruction in spelling unknown words improves both orthographic knowledge of words and transfers to improved word reading skills. Arra and Aaron (2001) provided second graders with either linguistic instruction, which involved direct instruction to improve spellings of words, or visual instruction, in which students were shown the correct spellings of words on flashcards but no attention was drawn to the graphophonemic features of the words. A second study provided the poorest spellers from the first study with either phonemic awareness training using aspects of the Lindamood-Bell Auditory Discrimination in Depth

program or visual training involving the presentation of words on flashcards. Results demonstrated that students in the linguistic and phonemic awareness training groups performed significantly better on retaining orthographic knowledge of words than either of the visual training groups. Similarly, Shahar-Yames and Share (2008) showed that training in spelling of target words improved retention for orthographic learning of nonwords as compared with reading the target words in context.

Ouellette and Sénéchal (2008) also demonstrated the effect of providing feedback to students on their attempted spellings of words. Preschoolers were randomly assigned to one of three conditions: invented spelling, phonemic awareness, and control. Students in the invented spelling condition received individualized feedback to improve their invented spellings of target words by one element. The phonemic awareness group focused on identifying the number of individual sounds in words. Although students in both the invented spelling and phonemic awareness group improved their phonemic awareness skills, the invented spelling group showed significantly better performance in orthographic memory for target words and on a learning-to-read task that used untrained words.

Ehri, Satlow, and Gaskins (2009) investigated the effect of combining spelling and phonemic awareness training on word reading for struggling first-, second-, and third-grade readers. Students in the Key treatment were instructed to apply an analogy approach to read new words by identifying a known word that rhymed and was spelled similarly to a newly presented word. Students in the Key Plus treatment condition were provided with training in counting phonemes in target words and comparing the number of phonemes identified with the graphemes in the spelling of the word. These students were also instructed to spell the words using Elkonin boxes and to identify spelling patterns in words. Students in the Key Plus program performed significantly better on reading and spelling words than students in the Key program did.

Regularly Versus Temporarily Irregularly Versus Permanently Irregularly Spelled

The previously reviewed research demonstrated the value in drawing students' attention to grapheme–phoneme relations to learn to read words. The belief that words on high-frequency/sight word lists are irregularly spelled and thus impossible or inadvisable to decode remains a prevalent mind-set. Although this may be true for some words, it is certainly not the case for the majority.

Several researchers have explained that English spellings are more regular than often perceived and that as students learn new phonetic elements, words become increasingly regular for reading and spelling (Carreker, 2011; Ehri, 1997; Joshi, Treiman, Carreker, & Moats, 2008; Moats, 2005; Treiman & Kessler, 2013). Similar to Carnine, Silbert, Kame'enui, Tarver, and Jungjohann (2006, as cited in Honig, Diamond, & Gutlohn, 2013), we want to emphasize that words fall into three categories—regularly spelled, temporarily irregularly spelled, and permanently irregularly spelled—to explain this transition from words being temporarily irregular based on student knowledge to regular once new learning occurs.

Regularly spelled words follow the conventions of the most common grapheme–phoneme relations. Once students know some letters and the sound or sounds those letters make, they are able to apply this knowledge systematically to decode regularly spelled words. Temporarily irregularly spelled words require knowledge of grapheme–phoneme relations that students have not yet learned; once students are taught these spelling patterns, however, the words are no longer irregularly spelled, and students are able to apply their new knowledge to decode them. For beginning readers, words that contain letter sounds that they have yet to learn may fall into this category, and for more advanced readers, knowledge of less common spelling patterns (e.g., the ending *-tion*), once learned, can be applied to multiple words containing these patterns. Permanently irregularly spelled words contain spelling patterns that are idiosyncratic to that word and may contain silent letters. These patterns are violations of typical grapheme–phoneme relations and may not be applicable to other words, although many of the other letters in these words may map onto reliable phonemes (see Figure 1).

Figure 1
Stable Grapheme–Phoneme Relations in Permanently Irregularly Spelled Words

have	*into*	*was*	*away*
/h/ /ă/ /v/	/ĭ/ /n/ /t/	/w/ /z/	/w/ /ā/

An analysis of the first column or category (preprimer) of words from two commonly used high-frequency/sight word lists (Dolch and Fry) that are often used for whole-word sight word recognition—without instruction on letter–sound relations—revealed that several words actually fall into the regularly and temporarily irregularly spelled categories (see Tables 1 and 2), based on the Common Core's Foundation Skills 3a and 3b standards for kindergarten. These standards state that by the end of the year, kindergartners should know the most frequent sounds made by consonants and the long or short sounds made by the vowels *a*, *e*, *i*, *o*, and *u*; therefore, words that contain one-to-one grapheme–phoneme relations with consonants making their most common sounds and the five major vowels making their long or short sounds would be considered regularly spelled. Students should be encouraged to decode these words, not memorize them by sight. Temporarily irregularly spelled words contain vowel patterns such as vowel teams, diphthongs, bossy *e*, *y* used as a vowel, *r*-controlled vowels, and digraphs. A typical beginning reader may not know these patterns but will eventually learn them with explicit phonics instruction. Although there are certainly permanently irregularly spelled words on these lists, they are not the majority, and even with their grapheme–phoneme violations and silent letters, it is important to note that most of the graphemes in permanently irregular words still map reliably onto phonemes (see Figure 1).

Of the 40 words on the first Dolch list, 17 (42.5%) were categorized as regularly spelled, 15 (37.5%) were categorized as temporarily irregularly spelled, and eight (20%) were categorized as permanently irregularly spelled. Of the 25 words on the first Fry list, 11 (44%) were categorized as regularly spelled, seven (28%) were categorized as temporarily irregularly spelled, and seven (28%) were categorized as permanently irregularly spelled. Again, even within the permanently irregularly spelled words, several of the letters match to regular phoneme representations (Ehri, 1997; see Figure 1). Drawing students' attention to these stable connections may support learning of the words.

The Intersection of Orthography and Instruction Resulting in Word Categories

The three categories used to classify words based on their spelling (i.e., regularly spelled, temporarily

Table 1
First Dolch Word List

Regularly spelled	Temporarily irregularly spelled	Permanently irregularly spelled
and /æ/ /n/ /d/	*away* /ə/ /w/ /eɪ/	*a* /ə/ and /eɪ/
big /b/ /ɪ/ /g/	*blue* /b/ /l/ /uː/	*come* /k/ /ʌ/ /m/
can /k/ /æ/ /n/	*down* /d/ /aʊ/ /n/	*one* /w/ /ʌ/ /n/
find /f/ /aɪ/ /n/ /d/	*for* /f/ /ɔːr/	*said* /s/ /ɛ/ /d/
go /g/ /oʊ/	*funny* /f/ /ʌ/ /n/ /iː/	*the* /ð/ /ʌ/
help /h/ /ɛ/ /l/ /p/	*here* /h/ /iː/ /r/	*to* /t/ /uː/
I /aɪ/	*little* /l/ /ɪ/ /t/ /əl/	*two* /t/ /uː/
in /ɪ/ /n/	*look* /l/ /ʊ/ /k/	*where* /w/ /ɛ/ /r/
is[b] /ɪ/ /z/	*make* /m/ /eɪ/ /k/	
it /ɪ/ /t/	*my*[a] /m/ /aɪ/	
jump /ʤ/ /ʌ/ /m/ /p/	*play* /p/ /l/ /eɪ/	
me /m/ /iː/	*see* /s/ /iː/	
not /n/ /ɒ/ /t/	*three* /θ/ /r/ /iː/	
red /r/ /iː/ /d/	*yellow* /j/ /ɛ/ /l/ /oʊ/	
run /r/ /ʌ/ /n/	*you* /j/ /uː/	
up /ʌ/ /p/		
we /w/ /iː/		

[a]The word *my* is categorized as temporarily irregular based on the Common Core's explicit assertion that kindergartners should learn to link the long and short vowel sounds with the graphemes for only the five major vowels. [b]The *s* grapheme is producing the /z/ sound, which is a frequent sound for that consonant. Based on the Common Core standard that students should learn the primary and frequent sounds for the consonant by the end of kindergarten, these words are categorized as regularly spelled.

Table 2
First Fry Word List

Regularly spelled	Temporarily irregularly spelled	Permanently irregularly spelled
and /æ/ /n/ /d/	*for* /f/ /ɔːr/	*a* /ə/ and /eɪ/
as[a] /æ/ /z/	*from* /f/ /r/ /ʌ/ /m/	*are* /ɑr/
at /æ/ /t/	*that* /ð/ /æ/ /t/	*have* /h/ /æ/ /v/
be /b/ /iː	*they* /ð/ /eɪ/	*of* /ʌ/ /v/
he /h/ /iː/	*this* /ð/ /ɪ/ /s/	*the* /ð/ /ʌ/
his[a] /h/ /ɪ/ /z/	*with* /w/ /ɪ/ /θ/	*to* /t/ /uː/
I /aɪ/	*you* /j/ /uː/	*was* /w/ /ʌ/ /z/
in /ɪ/ /n/		
is[a] /ɪ/ /z/		
it /ɪ/ /t/		
on /ɒ/ /n/		

[a]The *s* grapheme is producing the /z/ sound, which is a frequent sound for that consonant. Based on the Common Core standard that students should learn the primary and frequent sounds for the consonant by the end of kindergarten, these words are categorized as regularly spelled.

irregularly spelled, and permanently irregularly spelled) have both a conceptual and a functional purpose. Conceptually, words have spellings with set sequences of letters, which are read to establish their pronunciations and meanings (Ehri, 2000). As mentioned previously, the Common Core's kindergarten standards state that students should demonstrate knowledge of one-to-one grapheme–phoneme correspondence using the primary or most frequent sounds for each consonant and connect their knowledge of the long and short sounds of the five major vowels with the common graphemes for those vowels. Typically, beginning readers are first explicitly taught one-to-one grapheme–phoneme correspondences, which are helpful in learning to decode many regularly spelled words. Thus, regularly spelled words are characteristically those that conform to conventional grapheme–phoneme correspondences. For example, the word *me* would be coded as a regularly spelled word because the consonant *m* produces its primary sound, /m/, and the vowel *e* produces its long sound, /iː/. The word *is* would also be coded as regularly spelled based on the Common Core rationale. The *i* produces its short sound, /ɪ/, and the *s* produces a frequent sound for that consonant, /z/.

This characterization would make temporarily irregularly spelled words those that are not easily read by students using common one-to-one grapheme–phoneme correspondences alone or those that contain letter sounds that students do not yet know. For example, the word *my* would be coded as temporarily irregularly spelled because the *y*, although producing a frequent sound associated with the grapheme, is not one of the five major vowels. Additionally, the word *she* contains the diagraph *sh*, which, according to the Common Core standards explicated previously, is not expected to be taught during kindergarten. Permanently irregularly spelled words are those whose orthographies contain at least one grapheme–phoneme relation that is either highly uncommon or idiosyncratic to that word. For example, the word *a* would be coded as permanently irregularly spelled because within the word, the grapheme *a* can produce either a long *a* sound, /æ/, or a schwa sound, /ə/, and the schwa sound is uncommon for this grapheme. Additionally, the word *have* would be coded as permanently irregularly spelled because it represents a violation of the bossy *e* rule, according to which the *a* would produce a long *a* sound, /æ/.

As children learn to read, they develop knowledge of the alphabetic system as well as knowledge of specific words (Ehri, 2000). Knowledge of the general alphabetic system includes skills such as knowing letter names and sounds as well as how letters serve as graphemes that symbolically represent phonemes. It includes how to blend phonemes to produce known words, as well as knowledge of recurring spelling patterns and morphographs (i.e., the smallest unit of meanings involving root words and affixes). Ehri explained that this knowledge is a working knowledge. Thus, as students develop their knowledge, they employ it to read words.

According to Ehri (2000), word-specific knowledge comprises information about the spelling of individual words. Individual word learning is needed due to the various spelling possibilities for certain words that do not conform to the system. Knowledge

of specific words refers to the acquired memory that specifically guides the spelling, pronunciation, and meaning of words. This connection-forming process put forth by the connectionist theory applies to regularly, temporarily irregularly, and permanently irregularly spelled words (Ehri, 1992, 2000, 2005). Ehri (2000) explained that acquiring memory for the spellings of specific words also requires knowledge of the general alphabetic system, which serves as a mnemonic tool whereby students remember word spellings that do conform to the alphabetic system. Thus, word-specific knowledge is rooted primarily in students' knowledge of the general alphabetic system. Further, it can be surmised that as students accumulate word-specific knowledge, this knowledge may be generalized to spelling and reading similarly spelled words.

The spellings of most words are invariable (exceptions include color/colour and advisor/adviser). However, there is variability in students' level of alphabetic knowledge and their familiarity with different words, letter patterns, and set rules. Accordingly, it is important to conceive of these three categories in terms of the level of knowledge that readers develop about words, as well as how familiar the students are with the printed aspects of words. The three categories we discuss can be used to conceptually classify words to highlight regularly and irregularly spelled words as well as deviations in the system. Functionally, the three categories can be perceived as fluid in that a student's level of alphabetic knowledge determines where words fall in this categorization.

Through explicit instruction and experiences of reading words, students become analytic and add to their working knowledge of the alphabetic system. This increasing knowledge becomes a tool for reading whereby written words that were previously unknown or difficult to decode become familiar and easy to read. Words with spelling patterns that would be considered irregular from a grapheme–phoneme correspondence perspective shift to function as regularly spelled words once those patterns are learned (Ehri, 2000). Thus, the level of a student's systematic alphabetic knowledge determines how words are categorized for that individual. In this way, the three categories conceptualized earlier are not stable across all students and instructional contexts. They are fluid and function to describe what a student knows at a certain point in time. Thus, once a student learns about the *sh* diagraph and its corresponding sound, the word *she*, which was conceptually categorized as temporarily irregularly spelled based on the Common Core, would shift to being categorized as regularly spelled for that student. The ultimate goal is for temporarily irregularly spelled words, and even many permanently irregularly spelled words, to function for students as regularly spelled words.

Categories evolve according to what the teacher has taught and what the students have internalized. For educators, the three categories can serve many purposes to enhance their pedagogical practices. How words are categorized for a classroom and for individual students can serve as a tool to inform instruction. Teachers can analyze how students are tackling familiar and unfamiliar words while reading and spelling. They can assess how students are using (or not using) grapheme–phoneme relations and recurring spelling patterns while reading to inform the next steps in their instruction and adapt its scope and sequence. Further, this categorization can inform a teacher whether or not a student has internalized and is using taught rules when reading and spelling. Lastly, it can aid educators in critically analyzing the usage and purpose of word walls in the classroom as these word walls are often used to showcase words considered irregularly spelled high-frequency/sight words. The goal is for students to become analytic in their approach to decoding unfamiliar words, and ultimately the majority of words will be read automatically as sight words; that is, most words categorized as irregularly spelled will feel like and function as regularly spelled words for all students.

A Sight Word Success Story

A recent intervention conducted by Gregory (second author), which focused on grapheme–phoneme relations in sight words, produced promising results for struggling kindergarten readers. In this small study, a group of five students was flagged for poor performance on an assessment that measured ability to read 35 high-frequency words drawn from the TCRWP word list and the classroom word wall. All students read fewer than 25 words correct out of 35, with the average student correctly reading only 17.6 words out of 35. The target words were drawn from this 35-word list, and none of the students could read more than two of the target words used for the intervention.

The students met for eight sessions of approximately 10 minutes each in which they practiced

reading, pronouncing, segmenting, and spelling 10 regularly spelled words from the initial assessment: *am*, *an*, *and*, *at*, *can*, *in*, *it*, *on*, *up*, and *with*. Gregory classified these target words as regularly spelled because the grapheme–phoneme relations in the words abided by rules the students had already been taught. One of these words, *with*, contained the *-th* digraph and would normally be considered temporarily irregularly spelled because, according to the Common Core, it is not expected that kindergartners would learn this digraph; however, the students had already been taught this digraph in multiple lessons, and the word was therefore classified as regularly spelled. The words chosen for the intervention were part of the yearlong sight word curriculum and had been posted on the word wall as early as September; yet, by March, the students were still struggling to read them.

Gregory wrote each word on a whiteboard visible to all five students, pronounced the word, and prompted students to do the same. An oral segmentation exercise followed: together, he and the students pronounced each phoneme individually while tapping out the word on their arms (see Figure 2). Gregory then drew attention to the graphemes in the word by running his finger under each letter or digraph while pronouncing its corresponding sound, and while he repeated this process, students moved a single plastic math counter for each sound they heard (for the word *at*, they moved two counters; for the word *and*, they moved three) into a row of Elkonin boxes.

Gregory then covered the word, at which point students spelled it from memory in a second row of Elkonin boxes, using the counters they had moved as a guide to ensure that the number of graphemes they wrote corresponded to the number of phonemes they heard. Students were instructed to "write one sound in each box," rather than one letter; for example, the word *with*, which contains four letters but only three phonemes, was written across three boxes: *w*, *i*, *th*. When the students finished writing, Gregory uncovered the word and encouraged students to check their work, providing them time to correct any mix-ups that had occurred.

After only eight sessions, students made remarkable progress in sight word reading. A postassessment of the initial 35-word list showed overall improvement throughout the group, with the strongest impact seen on the 10 target words used in the pretest and practiced in the intervention sessions. Whereas students had been able to read an average of only 3.8 words out of 10 before the intervention, they were reading an average of 8.6 words out of 10—over twice as many—after receiving the intervention. One student, who had been able to read only one word out of 10 before the intervention, was now able to read all 10 words. On words that students had not practiced during the intervention, reading improved by an average of five words out of 25 (20%). This might suggest that the students were transferring their strengthened grapheme–phoneme skills to these nontarget words.

Results of a paired samples *t*-test (for all statistical tests, Cronbach's $\alpha = .05$; $t[4] = 4.31$, $p = .013$) revealed that students performed significantly better on reading target words from pretest ($M = 3.80$, $SD = 2.78$) to posttest ($M = 8.60$, $SD = 2.61$); similarly, results of the *t*-test applied to nontarget word performance also revealed a significant improvement in word reading performance from pretest ($M = 13.80$, $SD = 2.78$) to posttest ($M = 18.80$, $SD = 3.42$), $t(4) = 5.59$, $p = .005$. Caution should be taken with tests of significance using pre–post scores of the same target words, as there may be regression to the mean.

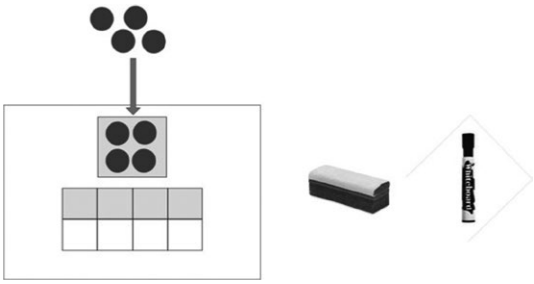
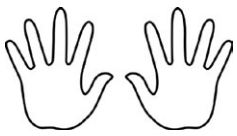
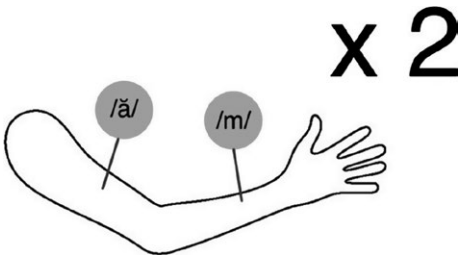
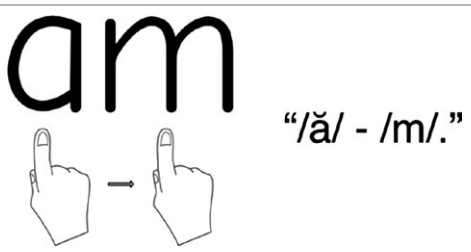
Large effect sizes were seen for target (Cohen's $d = 1.93$) and nontarget (Cohen's $d = 2.63$) word reading. In this study, effect size calculations were used to compare the difference between the mean performance from pretest to posttest. An effect size over 1 indicates that the difference was larger than one standard deviation, and an effect size larger than 2 indicates a difference larger than two standard deviations. In other words, these are noteworthy effect sizes.

Conclusions

These results could be great news for struggling readers and for educators who hope to expand their approach to sight word reading instruction, although caution should be taken when interpreting these results because of the small sample size and lack of a control group. By critically analyzing classroom sight word lists, teachers can identify regularly spelled and temporarily irregularly spelled words that may be suitable for explicit graphophonemic instruction as opposed to whole-word reading and spelling approaches.

The current study tells us that this intervention was successful for this group of students, but replication and extension of the study is needed to

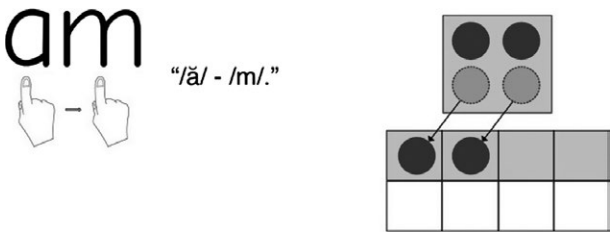
Figure 2
Grapheme–Phoneme Intervention Steps

Each student in the study group (SG) took a laminated activity sheet with a white background that contained, in landscape orientation, a large gray square with a black border above a two-row, four-column grid consisting of smaller squares with black borders, gray fill in the top row, and no fill in the bottom row. Students also took a dry-erase marker, an eraser, and four plastic math counters.	
SG sat on the rug facing the experimenter (E), who sat next to a whiteboard.	
E asked for "empty hands" when SG was ready to begin the lesson.	
E: "The first word is *am*. Say it: [SG and E] '*am*.'"	
E: "Tap it: [SG and E] /ă/ - /m/. Tap it again: [SG and E] /ă/ - /m/."	
E: "Now watch." E wrote *am* on the whiteboard, then pointed once underneath each grapheme, slowly saying the phoneme for each grapheme: "/ă/ - /m/."	

(*continued*)

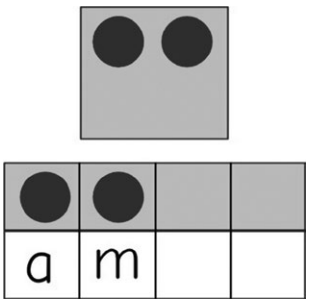
Figure 2
Grapheme–Phoneme Intervention Steps *(continued)*

E: "Now, move one counter—one at a time—for each sound you hear." E again pointed once underneath each letter, slowly saying the phoneme for each grapheme: "/ă/ - /m/."SG moved two counters from the large gray box into the first two gray boxes in the grid below.

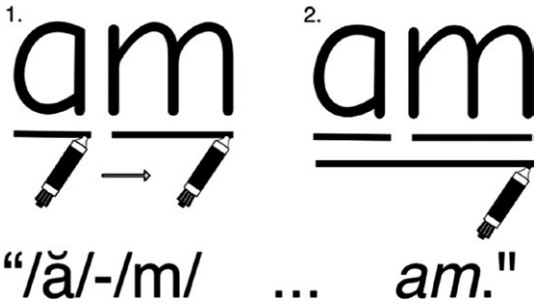


E: "Ready to spell?" When all participants in SG nodded, E covered the word *am* on the whiteboard. E: "Spell *am*."

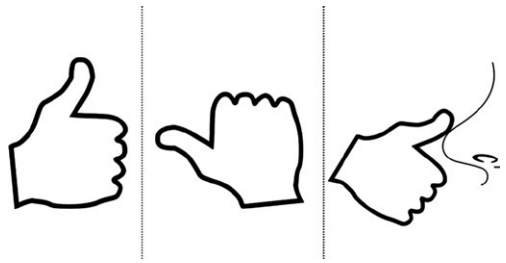
SG spelled the word in the bottom (white) row of the grid, writing one grapheme inside each box only in the columns that contained a counter in the top (gray) row.



E: "Caps on your markers when you're ready to check." When all participants in SG capped their markers, E uncovered the word on the whiteboard. E underlined each grapheme in the word while saying the corresponding phoneme ("/ă/ - /m/"), then underlined the entire word below the first instance of underlining while saying the word ("*am*").



E: "Thumbs up if you got it. Thumb sideways if you had a mix-up. Thumb on your nose if you had a mix-up, but you fixed it."

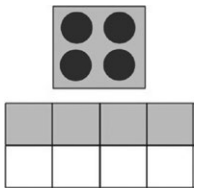


(*continued*)

Figure 2
Grapheme–Phoneme Intervention Steps *(continued)*

Participants who "had a mix-up"—who spelled the word incorrectly or split a digraph across two boxes—were asked to correct their spelling.

E instructed SG to erase their activity sheets, return their counters to the gray box, and wait for the next word.



demonstrate that the intervention has wider reach. Future studies should expand the sample size to increase the generalizability of the findings to other populations. Also, a control group should be included to demonstrate that the results are due to the intervention and not to other factors. Control groups may include an intervention that reflects the typical sight word teaching that occurs in early childhood classrooms (i.e., flashcard learning).

Training that promotes grapheme–phoneme relations has been widely shown in the reading science literature to be effective in furthering literacy development in young children (Arra & Aaron, 2001; Boyer & Ehri, 2011; Ehri et al., 2009; Ouellette & Sénéchal, 2008; Stuart et al., 2000; Uhry & Shepherd, 1997), and Gregory's intervention produced promising results after eight brief sessions. The intervention is accessible, straightforward, quick, and cost-effective, using basic classroom materials and widely available word lists.

In summary, educators should reflect on their own philosophies of sight word learning, carefully examine their sight word lists for regularly spelled words, consider which words on the list are temporarily irregularly spelled words based on students' graphophonemic knowledge, and then incorporate a graphophonemic instructional approach to better secure regularly spelled and temporarily irregularly spelled sight words in memory.

TAKE ACTION!

1. Examine the high-frequency/sight word lists used by you or your school.
2. Determine which words are regularly spelled, temporarily irregularly spelled, and permanently irregularly spelled. You may be surprised by how many words fall into the first category!
3. Supplement or modify your sight word instruction to include grapheme–phoneme training on regularly spelled words; teach them as you might teach CVC words such as *cat* and *dog*.
4. Consider using the grapheme–phoneme intervention described in this article when introducing and practicing a new grapheme–phoneme unit in a word considered temporarily irregularly spelled.
5. Reassess your students' sight word reading ability and reexamine your word wall. Consider what words you have posted and what instruction has been provided on these words.

REFERENCES

Arra, C.T., & Aaron, P.G. (2001). Effects of psycholinguistic instruction on spelling performance. *Psychology in the Schools*, *38*(4), 357–363. https://doi.org/10.1002/pits.1024

Boyer, N., & Ehri, L. (2011). Contribution of phonemic segmentation instruction with letters and articulation pictures to word reading and spelling in beginners. *Scientific Studies of Reading*, *15*(5), 440–470. https://doi.org/10.1080/10888438.2010.520778

Carreker, S. (2011). Teaching spelling. In J.R. Birsh (Ed.), *Multisensory teaching of basic language skills* (3rd ed., pp. 251–291). Baltimore, MD: Paul H. Brookes.

Ehri, L.C. (1992). Reconceptualizing the development of sight word reading and its relationship to recoding. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), *Reading acquisition* (pp. 107–143). Hillsdale, NJ: Erlbaum.

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. 237–268). Mahwah, NJ: Erlbaum.
Ehri, L.C. (1998). Grapheme–phoneme knowledge is essential for learning to read words in English. In J.L. Metsala & L.C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 3–40). New York, NY: Routledge.
Ehri, L.C. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders*, *20*(3), 19–36. https://doi.org/10.1097/00011363-200020030-00005
Ehri, L.C. (2005). Development of sight word reading: Phases and findings. In M.J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 135–154). Malden, MA: Blackwell.
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
Ehri, L.C., & Roberts, T. (2006). The roots of learning to read and write: Acquisition of letters and phonemic awareness. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy research* (Vol. 2, pp. 113–131). New York, NY: Guilford.
Ehri, L.C., Satlow, E., & Gaskins, I. (2009). Grapho-phonemic enrichment strengthens keyword analogy instruction for struggling young readers. *Reading & Writing Quarterly*, *25*(2/3), 162–191. https://doi.org/10.1080/10573560802683549
Honig, B., Diamond, L. & Gutlohn, L. (2013). *Teaching reading sourcebook* (Rev. 2nd ed.). Novato, CA: Arena.
Jorm, A.F., & Share, D.L. (1983). Phonological recoding and reading acquisition. *Applied Psycholinguistics*, *4*(2), 103–147. https://doi.org/10.1017/S0142716400004380
Joshi, R.M., Treiman, R., Carreker, S., & Moats, L.C. (2008, Winter). How words cast their spell: Spelling is an integral part of learning the language, not a matter of memorization. *American Educator*, *6–16*, 42–43.
Miles, K.P. (2015). *The effect of orthographic mapping, context, and word class on sight word learning for native and nonnative English-speakers* (Doctoral dissertation). Retrieved from http://academicworks.cuny.edu/gc_etds/595
Moats, L.C. (2005, Winter). How spelling supports reading: And why it is more regular and predictable than you may think. *American Educator*, pp. 12–22, 42–43.
Ouellette, G., & Sénéchal, M. (2008). Pathways to literacy: A study of invented spelling and its role in learning to read. *Child Development*, *79*(4), 899–913. https://doi.org/10.1111/j.1467-8624.2008.01166.x
Perfetti, C.A., & Hart, L. (2002). The lexical quality hypothesis. In L. Verhoeven, C. Elbro, & P. Reitsma (Eds.), *Precursors of functional literacy* (pp. 189–213). Philadelphia, PA: John Benjamins.
Rack, J., Hulme, C., Snowling, M., & Wightman, J. (1994). The role of phonology in young children learning to read words: The direct-mapping hypothesis. *Journal of Experimental Child Psychology*, *57*(1), 42–71. https://doi.org/10.1006/jecp.1994.1003
Shahar-Yames, D., & Share, D.L. (2008). Spelling as a self-teaching mechanism in orthographic learning. *Journal of Research in Reading*, *31*(1), 22–39. https://doi.org/10.1111/j.1467-9817.2007.00359.x
Share, D.L. (2004). Orthographic learning at a glance: On the time course and developmental onset of self-teaching. *Journal of Experimental Child Psychology*, *87*(4), 267–298. https://doi.org/10.1016/j.jecp.2004.01.001
Share, D.L. (2008). Orthographic learning, phonological recoding, and self-teaching. *Advances in Child Development and Behavior*, *36*, 31–82. https://doi.org/10.1016/S0065-2407(08)00002-5
Stuart, M., Masterson, J., & Dixon, M. (2000). Spongelike acquisition of sight vocabulary in beginning readers? *Journal of Research in Reading*, *23*(1), 12–27. https://doi.org/10.1111/1467-9817.00099
Treiman, R., & Kessler, B. (2013). Learning to use an alphabetic writing system. *Language Learning and Development*, *9*(4), 317–330. https://doi.org/10.1080/15475441.2013.812016
Uhry, J.K., & Shepherd, M.J. (1997). Teaching phonological recoding to young children with phonological processing deficits: The effect on sight-vocabulary acquisition. *Learning Disability Quarterly*, *20*(2), 104–125. https://doi.org/10.2307/1511218

MORE TO EXPLORE

- Birsh, J.R. (Ed.). (2011). *Multisensory teaching of basic language skills* (3rd ed.). Baltimore, MD: Paul H. Brookes.
- Henry, M.K. (2003). *Unlocking literacy: Effective decoding and spelling instruction*. Baltimore, MD: Paul H. Brookes.
- Moats, L.C. (2000). *Speech to print: Language essentials for teachers*. Baltimore, MD: Paul H. Brookes.