



English Spelling: Making Sense of a Seemingly Chaotic Writing System

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Spelling words in English can be a frustrating and discouraging experience for schoolchildren. For some words, spellers can easily achieve success by dividing the word into small units of sound, *phonemes*, and representing the phonemes by the letters that most commonly spell them. For example, the word *tip* is composed of the phonemes /t/, /i/, and /p/,¹ which can be straightforwardly spelled by the letters *t*, *i*, and *p*. Words such as *pat*, *fit*, and *shop* are easily spelled using such a sound-based or *phonemic* strategy. However, for many English words, spellers who use only a phonemic strategy will find themselves making many errors. For example, a word such as *pill* might reasonably be spelled *pil* by a phonemic strategy, because /l/ is most commonly spelled with a single *l*, but this spelling would be incorrect. How can children, particularly children with dyslexia, cope with a writing system that seems so unruly? Must children rely on brute-force memorization to learn the spellings of all but the simplest words? We will argue in this article that, although the English spelling system seems chaotic, there is some method to the madness. The writing system is more regular and more patterned than commonly believed. Children, including those with dyslexia, can take advantage of these patterns in learning the system, and teachers who are knowledgeable about the patterns can help them do so.

When we consider English in terms of its sound-to-spelling correspondences, it appears quite irregular. Other languages, such as Finnish, are more regular, in that each phoneme is represented by the same letter or letter group every time it occurs. For example, although the sound /k/ can be spelled in many alternative ways in English (*k*, *c*, *ck*, *q*, *ch*, or *cc*), the sound /k/ is always spelled *k* in Finnish. This one-to-one sound-to-spelling correspondence allows Finnish children to easily construct a word's spelling based on sound alone. Languages such as English or French have one-to-many sound-to-spelling correspondences. That is, a given sound or phoneme is sometimes spelled one way in one word and another way in a different word. For example, in English, the most

common spelling of the sound /ɛ/, as in *bed*, is *e*. However, this sound can also be spelled using *ay* as in *says*, *ea* as in *head*, *ie* as in *friend*, *ei* as in *heifer*, *eo* as in *leopard*, and *u* as in *bury*, among other spellings. In a statistical analysis of the sound-to-spelling correspondences in English, Kessler and Treiman (2001) found that vowel spellings are quite variable, in that there are many alternative spellings for each vowel sound. On a consistency scale of 0 to 1, with 1 meaning that the sound is always spelled the same way, vowels have an average consistency value of .53. Beginning and final consonant spellings are less variable, .91 and .82 respectively, but they are still far from completely consistent. Surely, the complexity of written English affects readers and spellers. In fact, recent research suggests that literacy development is more rapid in countries with regular writing systems, such as Finland, than in countries with less regular writing systems, such as England (Seymour, Aro, & Erskine, 2003). As we will see, though, the spelling system of English is more predictable than often believed, even though it is not as predictable as the Finnish spelling system.

The basic design principle of English writing has always been to represent sounds through letters. But a certain conservative force has partially subverted this basic design and even led indirectly to the incorporation of additional principles, such as the retention of foreign spellings in words borrowed from other language and the representation of linguistic information other than pronunciation (Kessler & Treiman, 2003). Although these principles can lead to inconsistent sound-to-spelling relationships, they also lead to other kinds of regularities in spelling that provide a great deal of information about words.

Conservatism refers to a reluctance to change spellings of words once they are widely accepted. If we changed spellings across time to reflect changing pronunciations, then readers would have to know older spellings when reading older texts and newer spellings when reading current texts. Conservatism keeps spellings the same for readers of English who speak

different dialects or have different accents. Speakers of English in the United States may not distinguish in their pronunciation between the *w* in *wine* and the *wh* in *whine*, but speakers of English in some other countries do make such a distinction. It would be cumbersome and add further irregularity to the system to change spellings of English words based on dialect. Although conservatism seems to add to the irregularity of written English, it actually serves a useful purpose by keeping spellings more consistent across time and across the world. This is important given that English is now spoken in so many countries around the world, each with its own accent.

Loanwords also contribute to the irregularities found in English spelling. Many words that we use today have been borrowed from other languages, including Latin, Greek, French, Italian, and German. When the words are borrowed, their original spellings are typically borrowed too. For example, *pizza*, *ballet*, and *sauerkraut* have been incorporated into English from Italian, French, and German with their original spellings conserved. It can be difficult for a speller who relies on a sounding-out strategy to construct the correct spelling of a word like *ballet*. Once the correct spelling is learned, though, it provides information about the origin of the word. Spellers and readers who know something about the origins of these words may understand that their spellings are not truly irregular in terms of English rules but follow rules of another system. The unusual spellings can provide useful information about the words to the language user.

Another culprit in making written English seem chaotic is that its spellings often represent information other than the phonemic makeup of the word. For example, in homophones such as *site* and *cite*, the spellings do not offer much information about the pronunciation of the words, as they are both pronounced the same way. Why are the words spelled differently if they are pronounced alike? One reason is that the spellings also provide information about the meanings

¹ Phonemes are represented by the symbols of the International Phonetic Association (1999) and are enclosed in slash marks.

English Spelling: Making Sense of a Seemingly Chaotic Writing System

continued from page 8

of the words. There is no apparent reason why *citation* is spelled with a *c* instead of an *s*, but given that it is spelled with a *c*, it makes sense that *cite* is spelled this way also. There are many cases in which knowledge about words' meanings helps us understand otherwise unusual spellings. For example, by knowing how to spell the word *heal*, we are better able to understand why *health* is spelled as *health*, and not *helth*. The fact that spellings of meaningful parts of words are often conserved in this way means that the English writing system represents more information about a word than just its pronunciation. As mentioned earlier, conservatism means that spellings are maintained even if pronunciation changes over time. If spellings were altered based on pronunciation alone, we would lose a great deal of information about the meanings of words. For example, the word *photography* is pronounced quite differently from its root word *photograph*. Similar patterns are seen in words such as *muscle* and *muscular*, as well as *nation* and *national*.

When we take into account the principles of conservatism, borrowed loanword spellings, and representation of information other than pronunciation, written English becomes less chaotic than it otherwise appears. However, these principles are sometimes of little use to beginning spellers and the teachers who are charged with helping them. For a child who is not familiar with *signature* and *signal*, the *g* in the spelling of *sign* is a hindrance, not a useful clue to the word's meaning. However, even young children can benefit from knowing how some words' spellings reflect meaning. For example, in the word *eat*, the *t* corresponds to a /t/ sound at the end of the word. Yet, when the child hears the word *eating*, the *t* represents a sound closer to a /d/ instead. Must the child memorize *eat* and *eating* as unrelated separate entities simply because the *t* sounds differently in the two words? If the child knows that *eating* is related to the word *eat*, then the spelling is less ambiguous. Research has shown that even children in kindergarten begin to use information about word meanings in spellings and that these skills continue to develop throughout elementary school (Treiman, Cassar, & Zukowski, 1994). By retaining spellings that are based on the underlying root word meaning, children can gain a good deal of information that would otherwise be lost if spellings were changed to match pronunciation.

Although young children may be able to take advantage of some clues from meaning, as in the words *eat* and *eating*, beginning spellers need additional strategies to help spell words correctly. Indeed, English spellings are more predictable when vocabulary level, position within a word, and surrounding context are taken into account.

Some spellings of sounds only occur in more advanced, low-frequency vocabulary words. For example, the sound /ɛ/ as in *bed* can be spelled *ei* as in the word *heifer*. However, young children are unlikely to encounter this word in their textbooks. Because children have never learned that *ei* is a possible spelling for the sound /ɛ/, they do not have to consider this alternative when deciding how to spell words that contain this sound. As this example shows,

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young children may have to learn fewer possible spellings for sounds simply because their exposure to print mainly comprises a smaller number of words.

The position of letters within a word is another clue that helps children limit spelling possibilities. Written English has many conventions that govern the arrangement of letters within words. For example, certain vowels are very rarely doubled in words. We know that *hiik* or *buup* are very unlikely to be English words, based on our knowledge that *i* and *u* hardly ever double. Also, certain letters and letter groups do not occur at the beginnings of words, but may occur in the middles or at the ends of words. One example of this is the letter group *ck*, which is allowed to represent the sound /k/ at the end of words as in *pick* and *pluck*, and in the middles of words, as in *package* and *cricket*. However, /k/ is never represented as *ck* at the beginnings of words. Spellers of English would never think of

spelling *kit* as *ckit* or *cap* as *ckap*. In fact, research has shown that young children have some knowledge of this rule even when it has never been explicitly taught to them in school and even when they have had only a few years of exposure to printed words (Treiman, 1993). Even children in the early years of school do not usually make mistakes such as *ckat* for *cat*. According to research by Cassar and Treiman (1997), kindergartners know that double consonants are allowed in the middles and at the ends of words but not at the beginnings. For example, *vassin* and *luss* could potentially be words of English, but *ssan* could not. By knowing where certain letters may and may not occur, children do not have to worry about certain alternative spellings. Even though the sound /s/ can be represented by *s* or *ss*, even young children know that the *ss* option is no longer valid if the sound occurs at the beginning of a word. They can therefore rule out a spelling like *ssip* for *sip*. Thus, children can further whittle down their list of possible spellings for a sound simply by knowing the ways in which letters are allowed to be arranged in words.

Finally, spellers may use the surrounding context to help them limit spelling choices. As mentioned earlier, English vowels are more variable in their sound-to-spelling correspondences than consonants (Kessler & Treiman, 2001). However, if the sounds around the vowel are taken into consideration, the vowel's spelling often becomes more consistent. If beginning consonant context is taken into account, average vowel consistency increases from .53 to .65. An example of this is the vowel sound /a/, as in the word *pot*. This vowel sound can be spelled *o* or *a*, but when it follows *w*, it is almost always spelled *a*, as in *wash* or *swap*. Therefore, by considering the context immediately before the vowel, the letter choices for the vowel's spelling are reduced. Vowel spellings are even more strongly affected by the final consonant. If the final consonant is taken into consideration, then average vowel consistency increases from .53 to .74. For example, the vowel sound /e/, as in *cake*, has many possible spellings, including *ay*, *ai*, *a* followed by final *e*, *ea*, *ei*, or *ey*. However, when the following consonant is *l*, then *ai* is a more likely spelling, as in *frail*. When there is no final consonant, then *ay* is most likely correct, as in *play*. Vowels are therefore made significantly more consistent when the neighboring consonants are considered.

continued on page 10

English Spelling: Making Sense of a Seemingly Chaotic Writing System

continued from page 9

Although consonants are generally more consistent than vowels, as mentioned previously, some consonants show improvements when neighboring vowels are considered. For example, in words that begin with the sound /k/, the vowel that follows plays an important role in the letter used to spell /k/. When /k/ occurs at the beginnings of words, the sound may be spelled with *k* or *c*. However, when the following vowel is *e* or *i*, the speller must choose *k*, as in the words *kite*, *keep*, and *kitchen*. Thus, spellers can limit their spelling choices for some beginning consonants by taking vowel context into consideration. Spellers receive even more benefit from using vowel context to help spell final consonants. An example of this is a rule that states when certain letters, such as *f* and *l*, are allowed to double at the ends of words. In words such as *pill* and *stuff*, when the vowel is spelled with one letter, these letters are generally doubled. When the vowel is spelled with two letters, the consonants are not doubled, as in the words *peel* and *roof*. With both consonants and vowels, then, spellers can benefit by paying attention to the environment of a sound that they wish to spell and not just to the sound itself. Context often lends additional regularity to words and provides clues to the correct spellings.

To summarize to this point, English is not as chaotic as it seems at first glance. Skilled spellers have an arsenal of tools at their disposal to better understand and reduce the variability in written English. Knowledge about conservatism, loanwords, and how English spellings represent more than just pronunciation helps spellers understand why certain words are spelled in seemingly irregular ways. In addition, spellers can use information about position and context to help limit the many possible alternative spellings that English provides for each sound.

Knowing that written English may be made more regular by considering all of these principles, how can educators and parents help children, especially children with dyslexia, take advantage of these clues? Research has shown that children at young ages are able to recognize some of these tricks without explicit instruction (Cassar & Treiman, 1997; Treiman, 1993). However, instead of forgoing instruction in the hopes that all children will pick up on the statistical regularities present in the language, teachers can instead make these clues more explicit by pointing out specific patterns that can help their students in spelling. Children need to be taught that, although English has some seemingly unusual spellings for some words, they do not need to guess at correct spellings or simply memorize them. Instead, children can be taught how to be spelling detectives

who look for patterns in unusual spellings.

One idea for teaching these patterns is to emphasize sound-to-spelling relationships during phonics lessons. Typically, phonics lessons focus on how letters represent sounds. In order to provide further practice to the beginning reader and speller, phonics lessons could also emphasize how sounds are represented by letters. Then the student sees that the same sound can be spelled in different ways, allowing the student the opportunity to figure out, with teacher guidance, when each spelling is used. Explicit instruction during spelling lessons can also help young spellers begin to identify patterns in English spelling. In typical spelling lessons, words are grouped according to word families, in which all of the words share the same spellings for part of the word. For example, a teacher may group the words *pill*, *bell*, *fill*, *sell* and *still* together in one lesson, pointing out to children that all of these words end with a double *l* spelling. This word family method is useful in that it provides students with many words that share a particular spelling pattern. However, this method does not explicitly teach children the situations in which they should use *ll* at the ends of words as opposed to *l*. Children may assume that they must memorize the seemingly unusual spellings. To counteract such tendencies, instruction could be designed to explicitly show children that most sounds have more than one possible spelling and that there are ways in which one can choose among them. Toward this end, for example, words with final consonants that double, such as *pill* and *stuff*, could be presented together in one lesson. Another lesson within the same spelling unit could show words in which the same final consonants do not double, as in *peel*, *tool*, and *roof*. Teachers would then have an opportunity to explicitly point out to students how the same final consonant sound can be spelled with one letter in some cases and with more than one letter in other cases. Students could then explore and generate ideas on when one uses each spelling. A wrap-up lesson at the end of the unit could include a summary list of words that show all of the spelling patterns for a particular sound. This would provide further practice for students, in that they could see all of the possible spelling patterns side-by-side and explicitly identify when each is used. Thus, teachers can create opportunities during spelling and phonics lessons for students to discover the patterns of written English. By explicitly pointing out regularities in English spelling, teachers can offer their beginning spellers additional strategies beyond rote memorization.

Will more explicit teaching of language patterns benefit students with

dyslexia? Certainly, all children can benefit from a more analytical approach to teaching spelling, but the advantages for children with dyslexia may be even greater. Because these children struggle with sound-to-spelling relationships, they may receive even more benefit from explicit instruction than children who are typical readers and spellers. When children with dyslexia are made aware of regularities in spelling, they are better equipped with tricks and strategies for deciphering seemingly irregular sound-to-spelling relationships. Spelling in English is not always a straightforward process, and all spellers can benefit from clues that help demystify some of the chaos.

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