

CHAPTER FOUR

Learning to Read, Write, and Spell Words in English as a New Language

New Vocabulary in This Chapter: *phonemes, graphemes, word recognition, decodable words, sight words, recoding, phonics, reasoning by analogy, alphabetic orthography, alphabet, consonantal alphabet, syllabic writing system, syllabary, logographic writing system, logograms, generative, orthographic transparency or depth, transparent/shallow orthographies, deep/opaque orthographies, opacity, orthographic depth hypothesis, transparency, word calling, digraph, pinyin, alphabetic/letter name spelling, numeric spelling, numeracy, emojis, morphemes, invented spelling*

In this chapter we discuss how learning to read is influenced by the orthography of the target language, in this case, English. Each written language in the world has an *orthography*, or writing system, and English uses the Roman alphabet. The way words are represented in the English writing system affects the way everyone, including ELLs, learns to read in English. The experiences ELLs have with the English alphabet can be influenced by the writing system of their first language and its orthographic distance from the English writing system. There are many positive aspects to first-language literacy, and knowing a writing system is a definite advantage that provides PCI for the learner, as we discussed earlier. However, learning the English writing system can be challenging and is too often overlooked in designing instruction for ELLs.

We begin by discussing how native speakers of English learn to recognize words and decode text.

How Word Recognition Occurs in English

To read English words, we learn to match their *phonemes*, or sounds, with their *graphemes*, or letters. When we learn to read English words, we learn to perform several steps very rapidly. First, we identify the first letter(s) of the word and try to find a matching phoneme. Then, working left to right, we quickly “sample” the rest of the graphemes and phonemes of the word. Holding the sounds in our working memory, we recombine them to form a mental representation that we attempt to match with a word from our listening vocabulary. Once that lightning-fast process occurs, we can access its meaning. Of course, there are other strategies involved if we are reading out loud or if we don’t already know the word. Goodman (1970) refers to this complex process as a “psycholinguistic guessing game.”

Accessing and recognizing individual words is called *word recognition*, and accessing and recognizing words in connected text is what we call *decoding*. There are two broad categories of words in English: those with easy-to-match phonemes and graphemes, called *decodable words*, and those that have to be learned as whole words, called *sight words*. Decoding and sight-word recognition are the primary word-attack skills for English word recognition. There are good reasons that English word recognition is taught through both phonological decoding and whole word memorization, which will become clear as we proceed through this chapter.

The process is somewhat different when we want to represent words in written form, which is called *recoding* (sometimes referred to as *encoding*). We retrieve the desired word from our listening vocabulary and try to write the letters that represent the sounds of the word, proceeding in order from left to right. Recoding words in English proceeds in two possible ways. It proceeds by putting letters in order, for easily decodable words, or by learning how to write some words by memorizing them, in the case of sight words.

Although some of the shortest and most common English words are sight words, overall the great majority of English words are decodable and recodable. Learning to decode and recode is necessary in order to read and write in English.

When learners decode English words, they start with the letter symbols and match them with the sounds, and when they write English words, they start with the sounds and match them with the letter symbols. No matter which end we start from, both processes involve matching the English sounds and letter symbol combinations. The skill involved in

matching sounds and letter symbols is called *phonics*. Phonics knowledge requires an understanding of how the English sound system and writing system map onto each other. In order to help learners develop the phonics skill, teachers need to understand how the phonemes and graphemes of English work together in the English writing system. At the same time, a teacher of ELLs also needs to appreciate how the orthographies of ELLs' first languages affect the ways they will learn to read and write in English. Exploring these similarities and differences is the principal purpose of this chapter.

For a native speaker of English, the process of learning to read and write words usually begins before or in kindergarten and continues until it is firmly in place, normally before third grade. This is a lengthy and often laborious process, and must be accomplished before the focus of reading can change from "learning to read" to "reading to learn." Learners of English as a new language need to go through this process just like native speakers do, but the process might occur at any age or grade level, depending on when ELLs begin to learn English. The phonics skills, or "bottom-up" skills, are critical to cracking the code for reading and writing English and must be accounted for in any comprehensive instructional program. As Calderon (2006) nicely summarizes, "Whatever the grade level, teachers with ELLs will eventually have students who need instruction in these basic skills, before they can comprehend a text" (p. 131).

Probabilistic Reasoning for Reading

We introduced the concept of probabilistic reasoning in Chapter 3 to talk about the advantage native speakers might have in figuring out the messages of spoken English. When probabilistic reasoning is applied to learning to decode, however, native speakers of English have less of a natural advantage. That's because English sounds do not predict English spelling patterns with a high degree of consistency so, in some ways, decoding is more of a level playing field. However, the big advantage for native English speakers is that they have a larger listening vocabulary, so it will help their probabilistic reasoning as they try to decode the sounds of an unknown word. However, we want to reiterate that learning to read and spell in English is not an easy task for either native speakers or ELLs. It is a tough job!

Even though the relationship between phonemes and graphemes is not consistent in the English writing system, L1 English readers can come to predict that when a consonant or vowel occurs next to certain other letters, it is likely to be pronounced in a specific way. For example, when

they see the word *pride*, even if they don't know its meaning, they can unconsciously compare it to other English words they know, such as *side*, and say to themselves, "This word is probably pronounced like *side*, a word I already know."

Probabilistic reasoning is honed through the stages of reading development and can be called *reasoning by analogy* (Goswami, 2013). *Reasoning by analogy* is the development of the ability to predict the meaning of unknown words through familiarity with the frames that surround the unknown element. As young readers have more experiences with print, they become better and better at predicting what the next letter of a word is likely to be and how it is likely to sound. When we become really proficient readers, we can even compensate for missing letters or missing words when the message is compromised somehow. The game show *Wheel of Fortune* is a contest that tests the probabilistic reasoning skills of contestants who try to be the first to guess a hidden phrase with the fewest letters revealed. McGuinness describes the process as when brains "actively resonate with regularities in the input, and automatically keep score of the probabilities of recurring patterns" (McGuinness, 2004, p. 47).

Probabilistic reasoning is embedded in many digital devices. Search engines "guess" how we want to complete a word or phrase as we type in the first couple of letters. If a person starts a Google search with the letters *st*, for example, the search brings up the most high-frequency letter string beginning with *st*, and it is often *Starbucks*. The same phenomenon occurs when a person starts a question or keyword search in Google, and Google bring up the most common ending to the string of words. Spell-check programs and apps also predict the word we were trying to spell based on the most common misspellings of the word.

Once we realize that we are talking about the brain's ability to make guesses based on its assessment of probabilities, we also realize that what we call "rules" are really just highly probable events, and "exceptions" are just less probable events. Seen that way, we can approach English decoding and recoding from a different perspective. English words don't "break spelling rules" but are instead less probable ways to represent the sounds of the word.

Let's look at how different writing systems are organized in order to better understand how sound and letter combinations work in English.

Major Kinds of Writing Systems

Over time, human beings have developed many kinds of orthographies. All of them are attempts to capture and preserve the information con-

tained in speech. The way an orthographic system represents spoken language influences how people learn to read in that language. Orthographies can be classified into three large systems: alphabetic, syllabic, and logographic (Birch, 2015; Perfetti & Dunlap, 2008). The major difference between these three systems is in the size of the unit the word is made up of. An alphabetic system uses a letter or letters to represent the sounds of a word; a syllabic system uses a syllable as the smallest unit to represent a word's sounds, and a logographic system uses a whole word as the unit for representing a word, giving less detail about its sounds. "The defining feature of a writing system is its mapping principle—graph to phoneme (alphabetic), graph to syllable (syllabic), and graph to word or morpheme (logosyllabic)" (Perfetti & Dunlap, 2008, p. 15). Within each of these large systems, there are many individual orthographies belonging to different languages. Moreover, each of these kinds of writing systems is well represented in the languages of immigrant groups to the United States and Canada.

When we learn to read in a new language, we need to learn its orthographic system. If we are literate in our first language, we also retain the knowledge of its orthographic system.

Alphabetic Writing Systems

An *alphabetic orthography* represents each sound with a symbol or symbols. The set of all of the symbols that can make up words is called an *alphabet*. Many languages use alphabetic orthographies. These include English, Russian, Spanish, Arabic, and many more. Within alphabetic orthographies, however, there are many different alphabets. English uses the Roman alphabet, and so do many other languages; however, the relationship between the letters and the sounds they represent differs from language to language. For example, the letters *ch* represent the /ch/ sound in English, as in the word *church*, but the /sh/ sound in French, as in the word *chateau*.

In addition to the Roman alphabet, the Cyrillic alphabet is a widely used alphabet for languages, including Russian, Ukrainian, Mongolian, and Bulgarian. A few of the letters are shared with the Roman alphabet, but most do not map to the same sounds, which means readers of those alphabets will experience initial interference in trying to read English words.

Arabic is another widely adopted alphabet. It is called a *consonantal alphabet* because only some of the vowel sounds are written out. The Arabic alphabet is used not only for Arabic, but for Urdu, Persian, Malay, and other languages spoken by many ELLs. It is written and read from

right to left, and it also uses a different numbering system from English. In addition, each Arabic letter can take three forms according to whether it is at the beginning, middle, or end of a word, but Arabic does not use capital letters. When L1 Arabic speakers are learning English, they need extra practice in learning how to say and write the myriad vowel sounds in English. In addition, they need practice in writing English numbers, using capital and small letters, and reading and writing from left to right as well as turning pages in that direction.

One of our students notes the fact that Arabic readers of English “rely heavily on the consonants when attempting to recognize English words” (Birch, 2015, pp. 40–41) and comments:

We know that this strategy is not very effective and can really cause problems for Arabic speakers trying to learn and pronounce similar sounding words in English. A perfect example of this is Hassan, my Arabic-speaking husband's frequently mixing up the name of my father, Gene, with my best friend's mother, Jan, and two of our good friends, Jenn and Jane. The fact that he has so much trouble hearing the differences between these tense and lax vowels has been the cause of confusion multiple times.—LEAH COOPER

Generally, ELLs whose first language is represented by an alphabetic script will have an advantage in learning to decode English words because they already understand the notion that the letters of the alphabet represent sounds. In addition, ELLs whose languages use the Roman alphabet have the added advantage of knowing some of the letters and numbers of English from the start.

Syllabic Writing Systems

The *syllabic writing system* uses a consonant–vowel combination as the smallest unit to represent sounds. Each symbol cannot be broken down further (Comrie, Matthews, & Polinsky, 1996). Languages that use syllabic orthographies include Japanese Hiragana and Katakana, Khmer, Hmong, Bengali, Gujarati, and Cherokee. Words in syllabic writing systems consist of a sequence of syllables, and the complete set of syllables in the language is called a *syllabary*. The disadvantage of a syllabic writing system is that words are often very long since the syllable is the smallest possible unit, and these long words can become unwieldy. Figure 4.1 shows a primer used to teach the syllables of Gujarati. Each of the symbols represents a whole syllable, and the whole word written under each illustration includes the syllable.

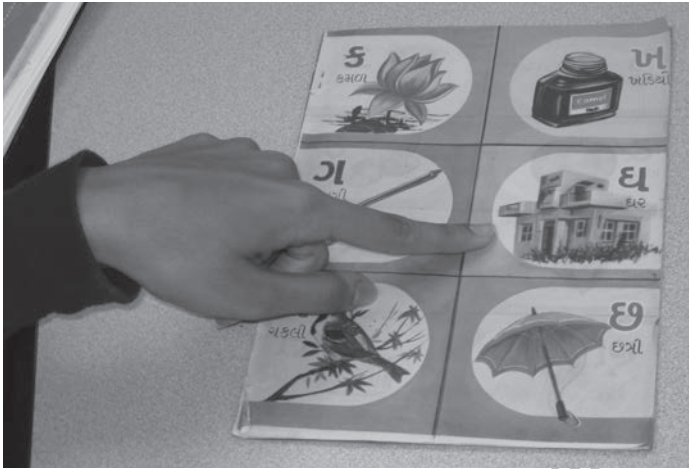


FIGURE 4.1. Learning the syllables of Gujarati.

Logographic Writing Systems

No writing system in the world is devoid of a phonological element. However, those that use a *logographic writing system* have less phonological information than alphabets and syllabaries. Chinese (Mandarin) has the best known logographic writing system. A Chinese word is composed of a radical that contains semantic information and a phonetic component, which is not always apparent. Chinese has about 2,500 *logograms* that can combine into many thousands of words (Yule, 2006). Because the smallest phonological unit is a word, reading Chinese involves less phonological processing but more semantic processing (analyzing of meaning). Nonetheless, it has been shown that phonological awareness, an important building block of reading, affects reading ability in Chinese as well (Pang & Kamil, 2003; Perfetti & Dunlap, 2008).

It takes a long time to acquire a complete set of logograms (McGuinness, 2004). However, there are two major advantages for logographic orthographies. First, they provide a direct pathway to meaning, allowing people to read and write “what they mean,” not just “what they say” (Ellis et al., 2004, p. 438), and second, since logograms carry less phonological information, they can be understood by a wide range of regional language and dialect speakers who cannot speak with each other but can understand each other’s writing.

Of the three orthographic systems, alphabetic systems have the added advantage of being the most *generative*, because a limited number of let-

ters and sounds can be combined to generate an astronomical number of words. The elegance and economy of an alphabetic system has convinced many societies to adopt them, as we shall see presently.

Although English uses an alphabetic writing system, it also contains logograms. These symbols, which include numbers, do not contain phonological information, but they form an integral part of the writing system. These logograms can be found on the standard keyboard. Examples of English logograms include \$, &, @, ?, and so forth. As students begin working in the content areas, they will be exposed to more and more logograms, especially in such fields as mathematics, chemistry, music, and computer science. These symbols need to be memorized and understood as whole units, just like other logograms.

The differences children experience in learning literacy through these writing systems are profound, but proficient readers emerge through the medium of all of these writing systems. For a detailed inventory of the world's writing systems, we recommend *Omniglot*, an online encyclopedia of writing systems and languages of the world (Omniglot, 2017).

Some of the diverse orthographies used by members of immigrant and ethnic communities in Chicago are featured in the photo essay Chicago Orthographies (Figure 4.2).

Orthographic Transparency and Depth

An important concept that describes how predictably writing systems represent the sounds of words is called *orthographic transparency or depth*. A writing system's orthographic transparency describes how closely its sounds and symbols correspond to each other. *Transparent* (or *shallow*) *orthographies* are writing systems that have a close match between their sounds (phonemes) and symbols (graphemes). These orthographies are also referred to as "phonetic," "consistent," or "reliable" in different academic sources, and they include such languages as Italian, Spanish, Czech, Turkish, Korean, and Dutch.

Opaque (or *deep*) *orthographies*, on the other hand, have symbols that do not match consistently with their phonemes. These languages include Chinese, French, Lao, Japanese Kanji, and most important, English. Languages that have kept the same written form for a long time are naturally more opaque because written language changes more slowly than spoken language does. Over time, the gap between the two forms widens. Another reason is that when a region or country is occupied or colonized, the central governmental authority may insist upon the use of a common writing system for convenience or national unity. For these and other reasons, languages with deep orthographies generally take longer to learn to read and write.



Amharic sign on an Ethiopian restaurant.



Georgian store with Georgian and Russian orthographies.



Chinese soybean seller in a new Chinatown neighborhood.



Bilingual sign in Vietnamese and Chinese.



Skokie Public Library welcomes its residents in many orthographies.

FIGURE 4.2. Orthographies found on signage in the Chicago area.



Korean signs adorn stores in many Chicago and suburban neighborhoods.



Neon sign in "Greektown."



Russian sign for a hearing aid company.



Arabic adorns all the panels of the door at this center.



English/Hebrew sign.



Hindi sign on a restaurant.

FIGURE 4.2. (continued)

Because English has an opaque orthography, many English words cannot be identified by sounding out the letters across the word. There are 40-plus phonemes in English (Ellis et al., 2004; Venezky, 1970), but only 26 letters to represent them; therefore, the alphabet letters must be used in a variety of combinations in order to represent English sounds (McGuinness, 2004). The letters *ough*, for example, have four different pronunciations in English, /uf/ for *tough*, /uw/ for *through*, /ow/ for *bough*, and /awf/ for *cough*. The pronunciations can only be learned by rote, not by decoding. English has such an extreme discrepancy between its sounds and letters that it has been called “the least consistent of any alphabetic orthography” (Caravolas et al., 2012, p. 679), and can even be considered an “outlier orthography” (Caravolas et al., p. 678).

Historical Features Contributing to the Opacity of English

English has an opaque writing system because of at least three historical factors that have had a significant impact. The first of these was the Christianization of England, in which new writing systems were adopted by the indigenous peoples who lived there. The second factor was the various foreign invasions that occurred, most notably the Norman Conquest in 1066, which infused spoken and written English with thousands of new French words. The Norman Conquest introduced a second word for many words that already existed in English, but they took on different nuances, with the French words having a higher status. Examples of parallel Old English and French words still found in English include *pig* and *pork*, *cattle* and *beef*, *sheep* and *mutton*, and *deer* and *venison*. The third factor is the effect of the wide diffusion of written materials that resulted from the invention of the printing press. Printed materials codified the spellings of some words and distributed them widely. All of these factors have contributed to the *opacity* of the English spelling system.

The opacity of English explains why not only ELLs but also native speakers of English have so much trouble with spelling. For example, both will have to figure out if the letter *c* is pronounced with a /k/ sound, as in *coat*, or with an /s/ sound, as in *city*. Some words even have silent letters, as in *comb* or *sign*, and these must be learned one by one, as sight words.

Chinese is also opaque because, although Chinese characters contain some phonological information (Li, 2002), the characters cannot be separated into a linear sequence of sounds. Like English, Chinese orthography is a writing system that has changed more slowly than its spoken forms, so its symbols are pronounced in many different ways. Because of its opacity, readers of Chinese employ a reading strategy that includes looking at the semantic element of a word more than its pronunciation clues. Recognition of the difficulty in learning to read Chinese has led

Chinese-speaking countries to adopt writing system reform, which will be discussed further on.

The Effect of Orthography on Learning to Read and Write

Katz and Frost (1992) proposed the *orthographic depth hypothesis* to address how different writing systems influence the ways children learn to read. They hypothesized that it would be easier for children whose orthographies were transparent to learn to decode and spell than it is for children whose orthographies were opaque, and that children whose languages had transparent orthographies would use more phonologically based strategies to identify words. The hypothesis has been confirmed by a number of studies, including one that examined children learning to read in alphabetic, syllabic, and logographic orthographies (Ellis et al., 2004). The children from transparent orthographies learned to read more quickly, read longer words more slowly, and were more likely to substitute non-words or nonsense words when they made reading mistakes. Children from more opaque orthographies, on the other hand, took a longer time to learn to read, did not read longer words more slowly, and were more likely to substitute other real words when they made reading errors. In addition, they were more likely to skip words.

These and comparable results have confirmed that readers from backgrounds with different orthographies enact different processes in learning to read. Readers whose writing systems have transparent orthographies read across the sounds of a word, which is why it takes them longer to read a longer word. In addition, the fact that readers in transparent orthographies are more likely to substitute nonsense words when reading aloud suggests that some may not be reading for meaning, at least initially. Clearly, this is the downside of the *transparency* advantage. *Word calling*, or decoding without comprehension, is possible because the ease of decoding allows the reader to focus on the sounds without analyzing the meaning of the words being decoded (Paulesu et al., 2000). Decoding is not really reading if it doesn't include comprehension. This statement is from an L1 reader of Korean, which is one of the most transparent orthographies.

When I read out loud in Korean in my school days, I often found myself decoding words without thinking about any meanings of the sentences, and now I understand what the reason might be. Also, I noticed that when I started learning to decode words in English, I couldn't comprehend much while reading aloud either because I mostly focused on decoding the words correctly.—SEUNG-HEE HA

Readers whose writing systems have opaque orthographies, on the other hand, go through different kinds of strategies as they learn to decode. Although phonological decoding is surely one strategy, they also engage in phonemic segmentation, whole-word recognition, probabilistic reasoning, and generalizing from syllable patterns found in short words, using *onset* and *rime*. As discussed in Chapter 3, an *onset* is the beginning sound of a syllable, and the *rime* is the remaining sounds of the syllable. The Ellis et al. (2004) study showing that readers from opaque orthographies make real-word substitutions when they read aloud suggests that they are probably using a different set of compensating strategies to read for meaning as they learn to decode.

Languages with opaque orthographies take a longer time to learn, and reading problems are more common for readers in those languages. A longitudinal study of children learning Welsh (a transparent orthography) and English in a dual-language setting found that after 3 years of instruction, no learners were still struggling to read in Welsh, but a number of learners were still struggling to read in English. The researchers concluded that “in the long term the detrimental effects of an opaque orthography are most damaging to the poorest readers” (Hanley, Master-son, Spencer, & Evans, 2004). Another downside to learning to read in an opaque orthography like English is that it takes a toll on the overall curriculum. Cloud (2016) summarizes it well: “There are places in the world where kids study architecture because there’s space in the curriculum for that because they’ve already learned to read. We’re very bogged down in the United States with the teaching of reading, and it cramps the curriculum, and in some cases it dominates the curriculum in very negative ways because it’s taking away other subjects that the students might have enjoyed learning about.”

Orthographic transparency and depth is one major factor related to the ease of learning to read and write. There are also three other issues related to writing systems. The first is the visual complexity of the writing system, the second is the closeness of the written language to the spoken form of the language, and the third is lack of access to L1 literacy.

Visual Complexity

In addition to its transparency, the visual complexity of a writing system affects how easily it can be learned. For example, Czech and Polish are two transparent orthographies, and they are moderately visually complex. In Czech, children must learn the complex consonant onsets found at the beginning of syllables (Caravolas & Bruck, 1993), but once they do, Czech is predictable. Polish has consonant *digraphs*, which can appear side by

side in a word (such as *cz* and *sz*, in the word for the Polish city *Szczecin*), but once this is learned, Polish too is elegantly decodable. However, some consistent orthographies are very complex, and take a long time to learn, and one of these is Modern Standard Arabic. Before it can be decoded, the learner has to master the wide range of symbols and sounds of the Arabic alphabet. It includes symbols for subtle vocal features such as glottal stops and consonant lengthening. As a result of this visual complexity, learning to decode Arabic will take a long time (Abdelhadi, Ibrahim, & Eviatar, 2011). Japanese, too, has a visually complex orthography, drawing upon four different writing systems, each of which is applied according to the specific text being read or written.

The “script,” or visual representation of a writing system, can also increase its visual complexity. A writing system may take several forms, including handwritten forms such as cursive, upper and lower case letters, and different fonts. Learners must be able to recognize a range of visual presentations of a writing system—and that includes the handwriting of the teacher, both on the board and on student assignments. Teachers cannot take for granted that their students can read their writing, especially if they are ELLs!

The Distance between Written and Spoken Language

Another important issue in mastering the written code of a language is how closely it corresponds to the learners’ spoken code. If students speak a version of the language that diverges greatly from its written form, they will have greater difficulty in recognizing the written forms of the words, because the words, and possibly some of the sounds, are not in their listening vocabulary. This is a concern for Chinese speakers whose first language is far from the spoken form of Mandarin that most closely matches written Mandarin. The distance between written and spoken forms is also a concern for those who speak a version of Arabic that is greatly different from Modern Standard Arabic. The same holds true for English dialect speakers in the United States. Of course, many groups of people grow up speaking a home language that is not represented in their school system at all, and that includes children in the United States who are placed in immersion situations. All of these discrepancies affect the ease of transition into reading and writing.

Lack of Access to L1 Literacy

Some students have not had prior access to literacy in their L1 for a variety of reasons. They may have had limited or no access to education, or their exposure may have been fragmented. Children from nonliterate

families might include refugee children, the children of seasonal workers, or children who have not been to preschool. For these children, learning English orthography will be their first exposure to an orthographic system, so all of the assumptions we can make about connecting sound to symbols must be unpacked and clearly presented. A child without prior literacy exposure needs to learn that the sounds they hear can be broken down sound by sound and represented with letters, that these letters form words, that these individual words have meanings, and that words can be strung together to represent thoughts. All of these understandings are not intuitively obvious, are not universal, and must be learned.

Writing System Creation and Reforms

When writing systems are created or reformed, the result can be an explosion of literacy. We give a few examples in the following accounts.

In 1819, after 10 years of labor, Sequoyah, a Cherokee man with an English father, created a writing system for Cherokee, which is a southern Iroquoian language. The phonetically regular, syllable-based orthography Sequoyah created was easy enough to learn that “within a few years after its invention, a high level of literacy had been achieved within the Cherokee community” (Comrie et al., 1996, p. 207), even surpassing the literacy rates of their European neighbors, according to historical records of the time (Wilford, 2009). This achievement was followed shortly after by the establishment of a bilingual Cherokee/English newspaper. Social studies teachers might well highlight this man’s remarkable achievement as part of the study of American history and culture. A simple Google search will uncover rich historical material about Sequoyah.

Other spoken languages have been codified into written forms recently. For example, since national independence, some postcolonial African countries have adopted local languages for use in instruction. The language policy of Nigeria states that Yoruba, Igbo, and Hausa, the major languages spoken in Nigeria, for example, be incorporated in the school curriculum, along with English and Arabic. Kiswahili (Swahili), an amalgam of several languages, has been adopted as the national language of Tanzania, where it is now the sole language of primary school instruction (Mohammad, 2015). Closer to home, the Navajo language is taught in the Puente de Hózhó Trilingual Magnet School in Flagstaff, Arizona, which has two-way immersion programs in Spanish/English and Navajo/English (Puente de Hózhó Trilingual Magnet School, 2016). These efforts help close the gap between the mother tongue and the written language children are expected to use in their schooling.

Writing system reforms have also made a difference in literacy levels. An important reformer was Mustafa Kemal Atatürk (1881–1938), the

founder of modern Turkey. He reformed Turkish orthography by adopting the Roman alphabet in lieu of the Arabic alphabet, which had been used for centuries during the Ottoman Empire. The Arabic symbols were not a close match with Turkish sounds, resulting in an opaque writing system that was difficult for Turks to learn to read and write. Modern Turkish script more closely matches Turkish sounds and is an easy alphabet to learn. Emel Gokçen describes the change in her own family that occurred when Atatürk introduced alphabet reform to Turkey.

When Atatürk changed the alphabet] my father immediately had a teacher come to teach my mother the new Turkish, the new alphabet. My mother could write in the old ways. She had been schooled enough to write her own letters. But she told me that the old Turkish writing, the Arabic alphabet, was so difficult that it took years to learn, whereas the new one was not only easy to read and write but very easy to pronounce. It is much easier to read than French or English because it is like Italian. You don't have to know the language. It was phonetically clear, very easy to learn. So all the grandmothers started reading books and learning. . . . Reading spread like wildfire all over Anatolia, and it reduced the tremendous ignorance of the population—the workers out in the fields and so forth; they could take part in a better government. (in Cherry, 2008, p. 25)

Other languages have adopted the Roman alphabet as part of their writing system reform, too, but the most far-reaching reform is certainly the introduction of the *pinyin* system for learning Chinese. Pinyin is a phonetically based alphabetic system that uses the Roman alphabet along with extra diacritics to represent the Chinese tonal system. Pinyin is used more or less as a “learner alphabet” to be coupled with learning Chinese logographs. It has made a great difference in access to literacy and has been incorporated in schools as a system of support. However, computer-based pinyin shortcuts, which are typed like alphabet letters instead of written by hand using Chinese calligraphy, have been shown to have negative effects on the reading of Chinese children who use it (Tan, Xu, Chang, & Siok, 2013).

Over all, it is much easier to learn to read in a transparent writing system. Some call transparent orthographies “learner-friendly orthographies.” They are also easier to read aloud because there are no unpleasant surprises.

Research published in *Nature Neuroscience* revealed that Italians were considerably faster in reading words aloud in Italian than English speakers were when they read English words. Positron emission tomography (PET) scans, which show which portions of the brain are in use while a person performs certain tasks, revealed that the portion of the brain

accessing phonological information was in greater use for the Italians than for the English speakers. Conversely, the portion of the brain used for naming objects and processing the meaning of words was used more for the English speakers (Paulesu et al., 2000). Greek children acquire decoding skills earlier than their English counterparts due to the transparent orthography of Greek (Tafa & Manolitsis, 2008). The benefits of learning to decode early on, however, do not necessarily translate into long-term superiority in reading comprehension (Ellis et al., 2004), because reading is so much more than decoding.

To me, learning to read in an opaque writing system is like learning to drive a car with standard transmission: it takes longer to learn, and there are more subskills involved, but once you've got it, it's just as smooth a ride. A driver learning to drive with automatic transmission is like a reader from a transparent orthography—he or she learns faster, but they may not have quite as good an understanding of how the car goes forward since it works just fine by pressing the pedal!—KRISTIN

Another advantage of transparent orthographies is that learners don't need to spend so much time on spelling as compared with learners from opaque orthographies.

A Mexican elementary school teacher in one of my classes said, "In Mexico there's no subject called 'spelling' like you have in America. That's because Spanish spelling, at least for most words, pretty much takes care of itself. When students start to write words in Spanish, they are easier to read than the invented spelling of kids in English."—LEAH

Many children have trouble learning to spell in languages with opaque orthographies, such as English, even if they can read well. When school systems place correct (often called "proper") spelling at a premium, a lot of students may believe that they can't write at all simply because they can't spell well, and this type of thinking can set in motion a syndrome of failure.

For an opaque orthography like French, on the other hand, spelling is elevated to the level of an important subject. Classes in "Orthographe," or spelling, are part of a French learner's language study, just as spelling study is, and needs to be, a part of language arts in schools in English-dominant countries, such as the United States and Australia.

Spelling is taught best as a reasoning activity, not just as a "hit-or-miss," rote activity. If a child writes the word *goal* as "gole," for example, it's an indication that the child hears the long-*o* sound and knows that some words with a long *o* can be spelled with a silent *e*, such as the words

pole or *role*. The spelling miscue demonstrates phonological awareness of the vowel sound as well as knowledge of the English spelling pattern of long vowels in words with silent *e* at the end. This is a good example of probabilistic reasoning in use.

The Strange Case of Proper Nouns and Names

The area where decoding and spelling hits the wall is with proper nouns, especially place names and last names. Often, they are cemented into a fixed spelling pattern even if their pronunciation has changed over time. Kids may need to learn to recognize and write place names as whole words, rather than sound-by-sound or letter-by-letter.

My mother's first name was Bengta, a Scandinavian name, and her last name was Disdier, a French name. These were both names that were hard to pronounce and spell. We lived in Bannock County, in Pocatello, Idaho. I learned how to spell all of those names very early by rote, through sheer necessity. My mom's name was not decodable at all, and neither was her personality.—LEAH

Table 4.1 gives a rough view of how easy or difficult it is for various L1 learners to attain literacy in their first language. The table applies to L1 learners only and considers the three levels of orthographic difficulty discussed previously: opacity, visual complexity, and closeness to the spoken language. As you can see, for L1 English learners, attaining literacy is difficult, whereas attaining literacy in Spanish or Russian as a first language is not as hard. Later, when ELLs undertake to learn English as a new language, they will find that some of the ease they might have had in achieving literacy in their first language does not carry over to learning to read and write in English. These three criteria do not include many other factors that contribute to literacy. As noted, the table's rankings apply only to native speakers of a language and do not imply that someone learning any of these languages as a new language will find the task easier or harder. The table illustrates how much orthography influences first-language literacy.

If the students you teach are from an unfamiliar language background, it's easy to find out how opaque their language is simply by asking the adults of their family two questions: "Is it hard to learn to read in your language?" and "Is it hard to learn to spell in your language?" If they attended school using that language, they should have a ready answer.

English sounds can be represented in a number of different ways, so spelling takes a long time to learn, and many people never learn to

TABLE 4.1. Difficulty Ranking for Selected LI Orthographies

Orthography	Opacity (closeness of symbol to sound and sound to symbol) ^a	Visual complexity (phonological or graphemic features in the orthography) ^a	Closeness to a spoken language ^b	Total score ^c
English	3	3	2–3	8–9
Arabic	3	3	1–3	7–9
Japanese	2–3, several orthographies used in combination, some more transparent than others	3	1	6–7
Spanish	1	1	1	3
Mandarin (Chinese)	3, without pinyin; 2, with pinyin	3	Native speakers of Mandarin dialect, 1; other dialects, 2–3	6–9
Persian	3	2	1	6
French	3	3	1	7
Turkish	1	1	1	3
Korean	1	1	1	3
Welsh	1	2	1	4
Russian	1	2	1	3

^a1 (easiest) to 3 (hardest).

^b1 (close to the spoken language) to 2–3 (for dialect groups depending on the distance from the spoken language).

^c3 (easiest) to 9 (hardest).

spell very well. The trickiest part of English spelling is usually found in its vowels. The sound /ay/, or the long-*i* vowel, for example, can be spelled in at least five different ways: *buy* (/bay/), *try* (/tray/), *sigh* (/say/), *height* (/hayt), and *lie* (/lay/). Also, the vowels of unstressed syllables in English are usually pronounced with the schwa sound /ə/, so it is impossible to “hear” the correct vowel even with good phonological awareness. The word *constant*, for example, is pronounced with a schwa sound /ə/ for the letter *a*, and, based on sound alone, it would be just as logical to write *constunt* or *constynt* as it is to write *constant*. There are thousands of English words with reduced vowels in unstressed syllables—we can’t hear

which vowel the reduced vowel is supposed to represent. That's where probabilistic reasoning comes in—we spell better when we know from reading that a sound pattern is more likely to be spelled a certain way, and in this case *-ant* is a more likely spelling pattern for those sounds than *-unt* or *-ynt*.

In addition, English has a larger variety of vowel sounds than many other languages, and these vowel sounds have multiple spellings. To spell a word, ELLs must first develop the phonological awareness to perceive the (often subtle) differences in vowel sounds. As the earlier anecdote about Arabic (p. 86) indicates, this is a challenge in itself. Then, using probabilistic reasoning, they must try to match the sounds with the grapheme(s) that seem most likely to represent the sound. Vowel sounds are the most malleable sounds of a language because they consist of air passing through the mouth, with the tongue and lips held in certain positions, and they are not tethered to the other organs of speech. Just think of the subtle differences between the sound of the vowels in *book* and *buck*, for example. Think, too, of how differently vowels are pronounced by people from different areas within the English-speaking world. Because it is hard to differentiate the sounds of English vowels to begin with, it is no wonder that it's hard to spell them.

When I first arrived in the United States, a friend was supposed to meet me at the airport. I waited in vain; he never showed up. After about 3 hours of waiting, I decided to take a cab. I told the driver that I was going to "Queen" Street. We drove around and around for another 3 hours looking for "Queen" Street. After a long drive around town, the cabdriver asked me if I had the address on a piece of paper. I said yes, and pulled it out from my folder and showed it to him. He went, "What are you talking about, man?" It was Quinn Street; we had passed it again and again, and I didn't pay any attention to it. I was too busy telling him to look for "Queen Street."—TENENA

Spelling Changes Due to New Technologies

Text messaging is having a profound effect on the way words are spelled, not only in English but in many other languages. Although learning to read and spell the full forms of words is still imperative in the classroom setting, informal messages increasingly use a combination of traditional spelling and alphabetic or numeric spelling of words. *Alphabetic spelling*, sometimes called *letter name spelling*, occurs when an alphabet letter is written with the expectation it will be pronounced by its letter name. The most common example is using the letter *u* to represent the word

you. *Numeric spelling* is the same principle applied to numbers; a number name is included in a word or sentence with the expectation that it will be pronounced by its number name. An example is *gr8* to mean *great*. These hybrid words are becoming more and more common in the literacy practices of young people and in advertising. Figure 4.3 shows some examples of alphabetic, numeric, and simplified spelling.

When I was a kid, we had autograph books, and everyone wanted to write a message that used alphabetic and numeric spelling. In my book, my best friend wrote "U R A QT. G I N V U." As you can see, I still remember it to this day.—KRISTIN

Two wonderful books by New Yorker cartoonist William Steig play with alphabetic spelling in a delightful way. They are called *CDB!* (1987) and *CDC?* (2003). The books consist of Steig's cartoons with captions created entirely of alphabet letters making whole sentences.

Implications for Teaching

ELLs who study English have home languages which have all kinds of different orthographies, with varying degrees of transparency. This requires that instruction in using the English alphabet should be differentiated according to the characteristics of the ELL's L1 orthography. If students have already learned to read and write in a transparent orthography, they may be good at phonological decoding, but may not notice when they read a real word as a nonsense word. In addition, they have to be taught to read for meaning. It is important to teach ELLs a number of strategies that L1 English readers use to decode and recode printed words. These include recognizing onsets and rimes, breaking a word down into its individual sounds, and practicing making guesses from context, among other strategies. An implication of *orthographic depth* is that children learning to read in a deep orthography need more training in phonological awareness and phonics (De Jong & van der Leij, 2002) because there are so many spelling patterns that can occur for each of the phonemes.

ELLs from languages with transparent orthographies that do not share the Roman alphabet with English, such as Bulgarian, will need to learn not only how to read for meaning, but also the details of the English alphabet and phonics system. As mentioned earlier, Arabic requires changing the directionality of reading and writing, as well as learning a new numbering system when learning English. ELLs who read Chinese will need extensive guidance and practice with phonological awareness as well as with the English phonics system. For these students, phonological



Simplified spelling.



We don't miss the *E* in HLP because the consonants guide us.



Simplified spelling.



A mix of standard and alphabetic spelling.



Simplified spelling.



A mix of numeric spelling and simplified spelling by vowel removal.

FIGURE 4.3. Use of alphabetic, numeric, and simplified spellings.



Simplified spelling on an awning.



Alphabetic spelling of *you* in a wordplay.



When *dough* changes to *do*, we lose the morpheme telling us it's made of dough.

FIGURE 4.3. (continued)

awareness will really bear fruit because it is the way they will be able to learn to decode unknown words.

We have summarized possible pedagogical directions for readers and writers from different L1 orthographies in Table 4.2. Of course, the amount of L1 literacy and prior educational experiences will influence the instructional focus as well. Table 4.2 can be used more or less as a checklist.

TABLE 4.2. Early Reading Instruction for ELLs Literate in Different Kinds of Orthographies

L1 orthographic system	Example languages	Spend more time on:	Spend less time on:
Transparent Roman alphabet with some similarities to English	Spanish Polish Turkish Welsh	English phonics (focusing on differences from L1), reading for meaning, learning sight words	Phonological awareness, phonics for sounds/letters shared with L1
Opaque Roman alphabet with limited similarities to English	French Portuguese	Phonological awareness, English phonics, learning sight words	Reading for meaning
Transparent alphabet or syllabary other than Roman alphabet	Ukrainian Arabic Korean Gujarati	Reading for meaning (for transparent), English phonics, learning sight words	Phonological awareness
Opaque alphabet or syllabary other than Roman alphabet	Mongolian	Phonological awareness, English phonics, learning sight words	Reading for meaning
Opaque orthographies that do not use an alphabet	Chinese Japanese Kanji	Learning the concept of an alphabet (representing sounds through symbols), phonological awareness, English phonics, learning sight words	Reading for meaning
Nonliterate	Any	All of these through a balanced literacy program	None

Numeracy: Also Not Universal

We expect to find different writing systems in the backgrounds of our ELLs, but we may not be as prepared for their different numbering systems as well. If you have ever tried to decipher the Roman numerals on a monument or a sports championship trophy, you can understand the frustration of looking at a numbering system you can't access automatically. Ironically, English uses the Roman alphabet and Arabic numerals, but the numerals used with the Arabic alphabet are not "Arabic numerals"! They originate from earlier languages, Sanskrit and Hindi. Here

are the numerals from 0 to 10 in Arabic orthography and their English equivalents.

٠	١	٢	٣	٤	٥	٦	٧	٨	٩	١٠
0	1	2	3	4	5	6	7	8	9	10

As you can see, some of the numerals look just similar enough to other symbols in English that they can be confused. For example, the 0 resembles a period (although it is placed higher above the line than the period, and the period is also used in Arabic). Math teachers in particular should factor in extra practice time for learners who have been taught math in a different numbering system. Like new languages, new number systems take time to learn.

In addition to numbers, punctuation symbols and math symbols differ among languages. These include the “hollow” periods used by Korean writers, the use of dashes in place of quotation marks, and commas in place of decimal points in many European languages. In addition, “upside down” exclamation marks and question marks frame Spanish sentences on two ends of the sentence. Some of these are non-effects and are not obstacles, but the more teachers know about their learners’ L1 written language systems, the better they can meet their students’ needs.

Emojis: A Writing System?

The changes resulting from the digital revolution include changes to written systems. A telling example is the choice of *emoji* as *The Oxford English Dictionary’s* 2015 Word of the Year (Oxford Dictionaries, 2016). The “word” they chose is actually not the word *emoji*, but rather the ever-expanding set of images that can be inserted into texts to express emotions, attitudes, or situations. Emojis are a byproduct of improved keyboards and number pads, which are now better able to represent shapes and symbols. Emojis can be “spoken” in any language and do not contain any fixed phonological information of their own. Since they cannot be broken down further, they most resemble logographic orthographies. Emojis are emerging as a new shorthand for conveying information quickly. However, using them does not enable language learners to practice the skills of decoding, handwriting, pronunciation, or spelling, and using them does not give the learner practice in becoming a better reader or writer.

Orthography Is Not Destiny . . . but It’s Important

When we discover how different orthographies influence the way students learn to read, write, and spell in their L1, it explains a lot about the way

they learn English. However, we add a word of caution: L1 orthography is only one factor in the vast array of factors that determines how ELLs learn English as a new language. Wang and Koda (2007) summarize it well:

L2 readers with different L1 orthographic backgrounds engage in both universal and language-specific processes. On the one hand, properties of the L2 writing system affect L2 processing similarly across learners irrespective of L1 backgrounds. On the other hand, L1 reading experiences also come into play in L2 reading. . . . The properties of both L1 and L2 interact with one another, jointly contributing to L2 reading processes. (p. 201)

HOW DOES THIS LOOK IN THE CLASSROOM?

Through lively implementation of engaging explicit instruction, guided practice, and communicative opportunities, we can help ELL students internalize the regular and consistent patterns of English graphemes and phonemes and learn the irregular, inconsistent words by heart, regardless of their complexity.

Identifying Logograms of English

Children can become familiar with identifying and using the logograms of English as they interact with them. Some of these are common punctuation marks, such as a period (.) or quotation marks (“”), and we want students to be able to recognize the logograms in context and identify or write them. Other logograms can be understood without being able to say the name commonly associated with them, such as “&,” which is named *ampersand* but functions to mean *and*. Children can create an illustrated book of logograms and the ways they are used in equations and sentences. Although we have never seen it, a “logogram wall” could be a fun way to call attention to their properties and give support for the “mechanics” of writing.

Using Morphemes in Opaque Writing Systems

Languages with *deep orthography* make up for their phonetic inconsistencies by conveying semantic information through their morphemes. *Morphemes* are the smallest units of meaning of a word, and they are the focus of Chapter 5. We can often figure out a word’s meaning by examining its morphemes. For example, *highlight* is not an easily decodable word because of its two silent *gh* letters, but learners can get a clue to its meaning if they can identify the two morphemes *high* and *light* in the word.

Phonological Awareness and Phonics

Phonological awareness and phonics skills can be developed through many enjoyable activities that increase metalinguistic awareness. Word sorts that use words from the day's lessons are one way to do this. Students simply write the new words on index cards and sort them by sounds or letter patterns. In a class of mixed ELLs and native English speakers, this might be best done in pairs. Another way to sort words is through word walls. Word walls can be organized by phonemes, not only by first letters of words. For example, students can classify words on the word wall according to their different vowel sounds.

Invented Spelling and Spelling Practice

In 1975 and thereafter, Read (1975) discovered that children learning to read and write in English go through predictable stages of spelling development (Peregoy & Boyle, 2005, pp. 195–199). In the first stage, the prephonetic level, children learn to hold writing instruments and move them across the page in “squiggles.” In the second stage, the phonetic level, children grasp the idea that letters represent sounds and that words can be separated into sounds and letters. At this stage, learners begin to represent the sounds they hear with the letters they know. In the third stage, called transitional spelling, they begin to apply their knowledge of both decodable words and sight words and write words using some of the patterns of English; finally, the fourth stage is conventional spelling, in which learners correctly represent the letters of an English word, whether it is a decodable or a sight word. Development through these stages can be slow, and specific instruction, as well as prior literacy experiences, can greatly influence how students progress.

The stages of English spelling development and error patterns may look different when children have learned to read and write in a different language. For children who have learned to read their language in a Roman alphabet, such as Spanish, for example, their spelling development may reflect Spanish phonological influence, such as using the letter *i* for words with the long-*e* sound (e.g., writing the word *seat* as “sit”). Children reading in a logographic orthography, such as Chinese, on the other hand, may remember the letters making up a word, but not the order of their appearance because reading Chinese characters does not require identifying sounds in sequence. Therefore, early learners may write the word *table* as “tbale” until phonological segmenting is firmly in place. These kinds of developmental manifestations are not learning disabilities, but stages of English language development.

Understanding the stages of *invented spelling* allows reading specialists to focus on exactly where an individual student might need help. At the same time, it enables early childhood educators to be able to read

the invented spelling of the early writing of children they work with. Because developing proficient English spelling takes a long time, having regular spelling lessons and quizzes makes sense. However, an integrated approach works better. “Make sure that encoding (spelling) and decoding (reading) are connected at every level of instruction via looking (visual memory), listening (auditory memory), and writing (kinesthetic memory),” suggests McGuinness (2004, p. 38). These lessons can begin with high-frequency decodable words and move toward less common, less decodable words, including sight words. Students can also take turns reading the week’s spelling words for the other students, giving them oral practice.

Here are a few possible ideas that give students a chance to practice spelling words based on specific sound and letter patterns.

1. Draw a picture that contains things with the letters *sh*. See who could draw the most items.
2. List five words that end with the sound /t/. (Remember, they might not end with the letter *t*!).
3. Make a list of items in the classroom that have a long vowel sound.
4. Make a list of animals and sort the names by the number of syllables each animal name contains.
5. Write one sentence that includes a word ending with a silent *e*.

Celebrating Different Writing Systems

Celebrating writing systems in schools and classroom helps students and their families gain an appreciation of the remarkable ways humans have devised to put words down in print. An innovative third-grade teacher, Theresa Kubasak, does this by organizing an annual Hangul Day Festival at her school. Hangul Day, which takes place on October 9, is a Korean holiday celebrating the invention of the Korean alphabet in 1444. It is touted as the most elegantly transparent alphabet in the world, both easy to read and easy to spell. At the all-school festival, parents from L1 languages with different orthographies are invited to share their way of writing with children and other families. Children and their families circulate among the classrooms and learn how to write their own names in Arabic, Chinese, Devanagari, Cyrillic, and other scripts. Each language station uses different materials to write, such as black ink painted on rice paper for Japanese, silver pens on black construction paper for Arabic, and fine-tip pens for Cyrillic. Theresa adds, “Also we splashed the room with environmental print from the various alphabets, which is easy to obtain in Chicago through menus, posters, newspaper ads, and wedding announcements. It is an amazing day in a classroom.” Celebrating Hangul Day helps all learners become more metalinguistic as they internalize the understanding that writing systems are widely

varied, invented, and arbitrary, and that all of them are ways to represent speech.

Exploring past and present writing systems, such as hieroglyphics, codes, and secret languages such as *nushū*, a Chinese writing system developed in one part of China for “women only,” adds even more luster to the learning of English orthography.

QUESTIONS FOR FURTHER STUDY

1. If you had to choose three important ideas from this chapter, which would you choose? How can you apply these ideas to your larger knowledge of teaching English as a new language?
2. Besides the probabilistic reasoning used in email programs, spellcheck, and cell phones, what are some other examples of probabilistic reasoning in the tools you use every day?
3. Look at the sign in Figure 4.4. Based on the analysis of writing systems in this chapter, what do you suppose the L1 writing system of the person who wrote this sign might have been? Why?
4. How do you make your handwriting accessible to the students in your classroom? How do you ensure that they can read the comments you write on their papers? Is this something you might want to work on?

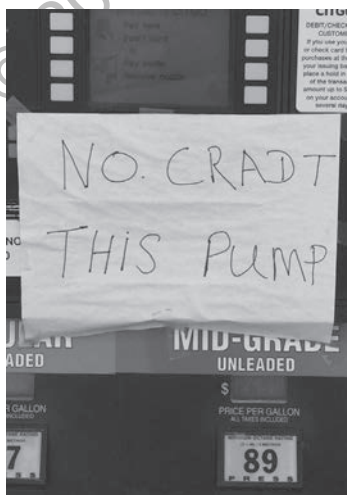


FIGURE 4.4. Sign on a fuel pump.

5. In what ways do you consider emojis to be a writing system? In what ways could they be used to help students build an understanding of written systems?
6. In what ways do you consider yourself to be a strong decoder (reader) or recoder (speller) in English? Do you remember how you were taught these things, and do you think the teaching was effective? Why or why not?
7. A 20-year-old immigrant from El Salvador never had the benefit of formal education. Now he wants to learn to read and write at a community college night school that offers a Spanish or English GED. His first language is Spanish, but he speaks some English. Would you advise him to learn to read and write first in Spanish, or in English? Why?
8. A Chinese ELL administrative assistant is typing names into a database and comes across a handwritten last name she cannot read. She types exactly what she sees: Sctubert. What do you think the name actually was? What is your guess based on? Explain this anecdote in terms of probabilistic reasoning. How could you help a Chinese ELL develop the kind of reasoning you applied to solve the unreadable name problem?
9. What experiences have you had trying to read another writing system? If you have done this, what kind of writing system was it? What strategies did you use to try to decipher it? Which strategies helped, if any?
10. Reflect on ways a teacher with a classroom of mixed-language ELLs can differentiate instruction so that children from backgrounds with different orthographies from the Roman alphabet can get the extra practice needed in decoding the Roman alphabet and developing reading comprehension skills.
11. A quipu is a set of knotted strings that was used as a writing system during the Inca Empire to keep track of inventories and convey news about the Empire (see a quipu in Figure 4.5). The knotting system was learned by select members of the court. The quipu was taken to the king by a runner, sometimes as far as 1,200 kilometers away, and “read” there. In what way can a quipu be considered an orthography? In what ways is it not?



FIGURE 4.5. Quipu from Peru. Reprinted with permission from Frank Salomon.

12. CHALLENGE QUESTION: Make a short list of place names, last names, and other proper nouns with which you are familiar. Then try to classify them into two groups: decodable, and whole words/sight words. What can you generalize from this, if anything, for the teaching of reading and spelling proper nouns?
 13. CHALLENGE QUESTION: What are some more examples of logograms in English? What kinds of lessons can be created to teach them? Write a possible lesson plan using logograms that are common in English, and if possible, try it out in a classroom. Reflect on what you learned.
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