3.1 Introduction

One of the greatest challenges experienced by reading specialists working in languages around the world concerns the orthographic under-representation of important linguistic features. The feature is considered to be important when regular and frequent confusion results from its lack of representation. Under-representation can result when the orthography of one language, whether European or other, is used to represent the linguistic features of another language which has more linguistic features. The mapping of linguistic features to graphemes is then greater than 1:1, that is, there are more language features than there are graphemes to represent them. Some features are then left unrepresented, or multiple features are represented by a single grapheme. This results in graphemes whose value is then ambiguous, leaving the reader to guess the value, or pronunciation, of the grapheme. Guessing can lead to a decrease in reading comprehension and/or reading fluency.

Orthographic under-representation may not have been intentional, as many well-meaning linguists, or others charged with making orthographies, may have been unaware of the importance of features in some languages such as tone, vowel length, or ATR (Advanced Tongue Root) vowel quality. Others may have been aware of these features but found them to be too complex and so chose to ignore them. Yet others may have suppressed the representation of these features for the sake of making the orthography look more like that of a European or other language. Whatever the case, once the orthography has been codified by linguistic and/or government authorities, attempted orthography reform can be unpopular because the reform process can demand a high level of effort and can be very time-consuming. Often the
authorities do not prioritize the gains in reading fluency and reading comprehension that could be realized with a more representative orthography.

Whatever the cause of resistance to orthography reform, the linguist/reading specialist can be caught in the position of having no option other than using the mandated orthography. In these cases, the reading specialist should have a toolbox which contains pedagogic techniques to lessen the effects of ambiguity due to orthographic under-representation. While an approach which includes phonics may effectively address most phonemes in an under-represented orthography, the remaining ambiguous graphemes will require additional attention. Such techniques will be discussed in the body of this chapter.

3.2 Theoretical issues

The design of an easily read orthography which represents all important linguistic features and phonemes is not a simple undertaking even with a modern understanding of linguistics and reading methodologies. The theoretical issues at stake pertain to both the linguistic and pedagogical domains.

Linguistic features such as tone and ATR are often represented on the vowel grapheme, frequently in the suprasegmental space immediately above the vowel grapheme. When two or more features are marked in the same space, the result can be rather confusing. Marking both features with diacritics on a single grapheme would result in overcrowding of the suprasegmental space. For example, ATR is frequently marked as a diacritic above the vowel grapheme. When the mandated orthography limits vowel shapes to a, e, i, o, and u, the result could be è, à, ì, ò, ù. If tone is also an important feature, then marking tone in the same suprasegmental space results in complex diacritic combinations that can be difficult to read. As an example, in Western Pokot, a Kalenjin language of Uganda, vowel length is represented by a diacritic in the suprasegmental space above the vowel grapheme rather than being represented by a doubling of the vowel grapheme. With the suprasegmental space already occupied by the vowel length diacritic, the marking of tone and/or ATR on the same vowel grapheme is not possible. In Western Pokot, tone and ATR are not marked; this leads to potential ambiguity.

To address the overcrowding of the suprasegmental space above the vowel grapheme, the use of additional grapheme shapes, such as ð and ð, has proven helpful in some languages, such as Mangbetu in eastern DRC. The additional vowel grapheme shapes represent ATR vowel quality, leaving the suprasegmental space above the vowel grapheme available to accommodate a tone marking. Vowel length is not problematic for the reader in that its occurrence is indicated by a doubling of the vowel grapheme. These additional vowel shapes are, despite their linguistic and pedagogical rationales, often rejected by some education authorities and language communities, because they do not resemble graphemes used in prestigious languages.

Whatever the cause of under-representation, the reading specialist must find a way to teach reading using the mandated orthography. Some reading methodologies are more suited to teach orthographies which are transparent and have a 1:1 phoneme to grapheme ratio. These same methodologies struggle,
however, to address ambiguous graphemes and so should be complemented by the inclusion of additional pedagogical techniques.

### 3.3 Suggested pedagogic activities

There are circumstances in which the reading specialist is compelled to work with an orthography that under-represents important linguistic features, resulting in ambiguous graphemes.

One possible approach in such situations consists of a series of learning activities which guides the learner from the known, the sounds of their own language, to the unknown, the ability to decode the sound/symbol relationship of ambiguous graphemes. In this approach, the 5 C’s (phonemic awareness, phonics, vocabulary, fluency, and comprehension) will remain in focus, but the competencies of phonemic awareness and phonics will be bolstered by additional pedagogic techniques.

1. **The first technique** is a phonemic awareness activity that raises the students’ awareness of the different sounds in the language and teaches them to distinguish between these sounds. This is strictly an oral exercise; no print is used. No mention is made of the fact that two different sounds are being represented by the same grapheme. The activity begins by introducing the sound to be learned with the popular ‘I say, We say, You say’ procedure. The teacher then orally presents the students with words from a prepared list, some of the words contain the new sound and some do not. Students are invited to interact by raising their hands each time they hear the new sound in the words which are read one at a time by the teacher. The teacher reinforces appropriate responses. Next, the students are invited to propose words which contain the new sound from their own mental repertoire. When a proposed word does contain the new sound, the teacher asks if the word contains the new sound at the beginning, middle, or end of the word.

2. **The second activity** serves to further differentiate sounds by sorting words according to the sounds in question. Again, as this is strictly an oral activity. The activity begins with the presentation of two images, perhaps drawn on a chalkboard. The two images are introduced using ‘I say, We say, You say.’ The names of the images are minimal pairs; that is, they are pronounced exactly the same except for the pronunciation of the ambiguous grapheme which would appear if the word were written. As an example, the two words differ only by the + or − ATR quality of the vowel, a distinction made in oral language but not in the written. These words are homographs but not homophones. The teacher then orally proposes other words that contain either the + or the − ATR vowel quality of the vowel in question. Students recognize the sound and indicate the image on the board which contains the same vowel quality. The distinction between long and short vowel sounds in English could be taught using this activity. The word wind (to wind a watch) and wind (a breeze) differ only by this feature. An image of each is drawn on the board. When given the word ‘find’, the student would recognize the long i sound and sort it with the image of winding a watch. When given the word ‘fin’, it would be sorted with the image of breeze. This activity works best when monosyllabic words are used so that the vowels of syllables not in focus do not cause a distraction.
3. A similar sorting activity can also be used in the phonics section which teaches sound to grapheme relationships. Having heightened the awareness of the existence and distinctions of these sounds, this activity now teaches the student to relate them with their associated graphemes. Two minimal pair homograph images drawn on the board are now accompanied by the spelling of each word written directly below its corresponding image. The teacher then writes a new word on the board which contains the same + or the – ATR vowel sound as in one of the words already written on the board. Students are then invited to come rewrite the new word under the image/word that has the same vowel quality. This procedure can be repeated for many words, eventually resulting in two lists of words distinguished by vowel quality. This activity is greatly facilitated if all the words implicated are decodable and monosyllabic.

4. Another helpful technique is the familiar cloze activity. This activity teaches the student to associate and distinguish the multiple pronunciations of an ambiguous grapheme as well as the meanings of homographs, according to the context in which it is found. The Cloze activity is made possible by teaching unambiguous graphemes first to provide decodable context which can be used to guess the pronunciation of the ambiguous grapheme in question. The teacher presents a word which is spelled out minus the ambiguous vowel grapheme. A blank represents the spot where the grapheme would normally appear in the printed word. The student is asked to write in the missing grapheme and to orally fill in the blank with whichever pronunciation of the ambiguous grapheme makes sense. As a hint, an image may accompany the incomplete word, or the word may appear in a sentence.

### 3.4 Conclusion

While it is preferable to represent all important linguistic features in an orthography, this is not always possible. Orthographic under-representation can result in ambiguous graphemes. In these cases, the reading specialist should reinforce their approach with additional pedagogic techniques. The techniques described above have worked well in Africa, especially among those orthographies which include ambiguous graphemes due to the under-representation of important linguistic features such as tone and/or ATR. These activities should be included in the teacher guide and should be thoroughly covered during initial and in-service teacher trainings.