1 Introduction

1.1 The phonemic principle

An important feature of all human languages is that the meaningful utterances that we use to communicate with each other verbally are made up of a small number of building blocks, a handful of sounds, consonants and vowels, that, by themselves, are meaningless. Thus, for instance, in the Spanish word *sopa* 'soup' we recognize four distinct sounds or PHONEMES, *s-o-p-a*. These are the same sounds that, in different orders, are used to produce the words *paso* 'step; I pass' and *sapo* 'toad'. It is important to realize that these sounds do not possess any meaning in themselves. The Spanish word *sopa* means 'soup', but the sound /s/ does not mean anything. Although *sopa*, *paso* and *sapo* all use the same four sounds of the Spanish language they do not share any feature of meaning. The crucial thing about phonemes is that they are contrastive. If we replace a phoneme in a word with a different phoneme – or change the order of phonemes in the word – we don't have the same word anymore.

Individual languages, of course, vary in the specific sounds that they use, but the number of contrastive sounds in a language is always small, if we consider the number of words, the size of the vocabulary that is constructed by putting together these consonants and vowels in different combinations. In Spanish there only five vowel phonemes and fewer than twenty consonant phonemes – the exact number depends on the dialect. English has a slightly larger consonantal inventory (twenty-four or so) and more than twice as many vowel phonemes as Spanish.[1]

[1] The number of phonemes in Spanish comes close to the cross-linguistic average of 25 (Maddieson 1984). Extreme cases are the Amazonian language Pirahã (Brazil), with only 10 phonemes, including 7 consonants and 3 vowels, and, at the other end of the spectrum, the Khoisan language !Xũ (Southern Africa), with 119 phonemes (Trask 1996, under 'Phoneme system').

In addition to segmental phonemes, consonants and vowels, languages may also have contrasts of meanings among words that depend on SUPRASEGMENTAL or prosodic features, such as WORD-STRESS and TONE. In Spanish, word-stress is contrastive or phonemic, as we can see from the fact that *paso* 'step; I pass', with STRESS on the first syllable, and *pasó* 's/he passed', with stress on the second, are different words: changing the position of the stress produces a concomitant change in meaning.

Unlike, for instance, Chinese or Yoruba, on the other hand, tone is not lexically contrastive in Spanish. Whether we say *pan* with a falling tonal contour or with a rising contour, we still have the same word meaning 'bread'. In both Spanish and English we may use a rising contour to ask a question (*¿Quieres pan?* 'Do you want bread?') and a falling contour in a statement (*Quieres pan.* 'You want bread'), but this is purely a matter of INTONATION and, unlike the position of the stress, does not affect the identity of words.

1.2 Sounds and symbols: orthographic and phonemic representation

Alphabetic writing is based on the possibility of identifying the contrastive sounds or phonemes of the language. In an ideal phonemic orthography there would be a one-to-one relationship between letters and phonemes: each letter would represent a different phoneme and each phoneme would be written with a different letter. Of course, actual alphabetic orthographies, used in real languages, depart from this ideal to a greater or lesser extent for all sorts of reasons, which we briefly address in Appendix B for Spanish.

In the conventional orthography of Spanish, there is an almost perfect correspondence in one direction, from written form to pronunciation: generally, there is only one possible way to read a given sequence of letters. Exceptions are very few indeed (see next section). Anyone who has learned the sound values of Spanish letters and letter combinations can accurately 'sound out' any word or text written in Spanish, even without knowing the meaning of the words. Unlike English speakers, Spanish speakers never have to consult the dictionary to verify the pronunciation of a written word that they have not seen before (unless it is perhaps a foreign proper name or a word from another language).

In the other direction, from sound to letter, there are more difficulties. It is not the case that native Spanish speakers always know how to spell all words. The same sound or sound combination can be spelled in two or more different ways in several instances.

Since in this book we will be concerned with pronunciation, we need a more accurate way of representing sounds than that provided by standard

orthography. There are also other reasons for using a different transcription system from ordinary orthography – a phonetic alphabet. Regional varieties of Spanish differ in aspects of pronunciation, but these differences are often hidden under a common spelling system. In addition, we will be comparing the sounds of Spanish with the sounds of English, and occasionally with those of other languages, for which purpose we need a common way to represent sounds which is independent from the spelling conventions of each of these languages. For these reasons we need to use a phonetic alphabet.

When we talk about phonemes, we will put them between slanted lines in order to indicate clearly that we are making reference to phonemes, not to conventional orthography. Thus, for instance, we may say that a phonemic transcription of Spanish *halo* 'halo' is /álo/, since the *h* is not pronounced; it does not represent any phoneme at all. We will also, for instance, transcribe *casa* 'house'and *queso* 'cheese' as /kása/ and /késo/, respectively, in order to make clear that these two words start with the same phoneme, in spite of the fact that different letters are used to represent this sound in the conventional spelling. Notice also that in our phonemic transcriptions we will mark word-stress even when this is not indicated in conventional spelling, according to the orthographic rules, since, as we already know, word-stress is phonemic in Spanish.

With minor adaptations, the symbols that we will use in our phonemic transcriptions are those of the International Phonetic Alphabet or IPA (see table on p. xix). Some of the symbols of this alphabet are ordinary letters of the familiar Roman alphabet. We are following the IPA, for instance, in using /k/ to represent the initial consonant of *casa* /kása/, *queso* /késo/ and *kilo* /kílo/. As we will see, the IPA also uses some special symbols to represent certain sounds. Because Spanish orthography follows the phonemic principle to a great extent, as we said, our phonemic representations in general will not differ greatly from the way words are normally spelled.

1.3 More on Spanish orthography

1.3.1 Letters with more than one phonemic value

Although reasonably effective, Spanish orthography has some non-phonemic aspects. There are only a couple of cases where the way a word is pronounced is not completely predictable from the spelling. One is the pronunciation of the letter *x* in a few proper names, such as *México* (where it has a very different value from, for instance, that in *taxi*). The other case is presented by some sequences of vowels where, as we shall see in detail in Chapter 5, some speakers make a contrast not reflected in the orthography, so that, for instance, *duelo* has

two syllables, *due-lo*, but *dueto* has three, *du-e-to*. Leaving these minor details aside, there are no ambiguities in letter-to-phoneme correspondences.

1.3.2 Phonemes spelt differently in different contexts

There are more complications in the other direction; that is, in the phoneme-to-letter mapping. Some phonemes are written with different letters depending on the context. Thus the phoneme /k/ is written as *qu* before *e* and *i* as in *queso* /késo/ 'cheese', *quiso* /kíso/ 's/he wanted', and with the letter *c* in other contexts, as in *casa* /kása/ 'house', *cosa* /kósa/ 'thing', *Cuba* /kúba/ (the letter *k* is also used in a few technical and foreign words, such as *kilo*). Similarly /g/ is written as *gu* (with silent *u*) before *e* and *i*, as in *guerra* /gér̄a/ 'war', *guisa* /gísa/ 's/he cooks'. To indicate that the *u* is pronounced after *g* a dieresis is used in standard Spanish orthography, as in *agüita* /aguíta/ 'water, *dim.*', *cigüeña* 'stork'.

There are some other minor complications. The letter *y* is used to represent the vowel /i/ in the conjunction *y* 'and' and is also used after a vowel in word-final diphthongs, but not in diphthongs in the middle of the word, so that the same sequence of sounds is written in one way in *rey* 'king' and in a different way in *reina* 'queen'. This is a minor rule of spelling that can be easily remembered.

Spanish has two 'r sounds' (or RHOTICS): a strongly trilled /r̄/, as in *guerra* /gér̄a/ 'war', *roca* /r̄óka/ 'rock', *honra* /ónr̄a/ 'honor', and a tapped /ɾ/ as in *pero* /péro/ 'but'. These two sounds only contrast in word-internal intervocalic position (that is, between two vowels inside a word), where the trill /r̄/ is written as *rr* and the tap /ɾ/ as *r*. Notice, however, that a single *r* is also used to represent the trill in positions where there is no contrast, because the tap is not found there in any words; that is, word initially (*roca*, *rey*) and after the consonants /n/, /l/ and /s/ (*enredo* 'tangle', *alrededor* 'around', *israelita* 'Israeli').

1.3.3 Phonemes spelt in more than one way in the same context

The real thorny details of Spanish spelling however – those that create problems for school children and other writers – have to do with the fact that in a few cases the same phoneme is spelt in different ways in exactly the same context.

a) To begin with, the same sound is written in three different ways in *dije* 'I said', ***g**ente* 'people' and *Mé**x**ico*. Following the conventions of the IPA we will represent this sound – 'a hard aitch' as in Scottish *lo**ch*** and in German *Ba**ch*** (or, in more technical terms, which we will learn later, a VOICELESS VELAR FRICATIVE) – as /x/ everywhere in PHONEMIC TRANSCRIPTION: /díxe/, /xénte/, /méxiko/. In the standard Spanish orthography the letter *x* represents

a voiceless velar fricative only in a few names such as *México* and *Oaxaca*. Aside from such names, the letter *j* is always used in /xa/, /xo/, /xu/ (*jarra* 'jar', *jota* 'a dance; letter j', *juzgar* 'to judge'). The phonemic sequences /xe/, /xi/, on the other hand, are written with *j* in some words (as in *jefe* 'boss', *jinete* 'rider', *jirafa* 'giraffe', *paje* 'page, servant') and with *g* in some other words (as in *gesto* 'gesture', *genial* 'genial', *girar* 'to turn around', *página* 'page of a book'), without any immediately obvious reason for the choice. This, in fact, represents one of the main challenges for Spanish-speaking children learning to write in their language. The Spanish poet Juan Ramón Jiménez (1881–1958) proposed to do away with what for him was an absurd complication of the orthography and wrote /xe/, /xi/ always with *j*, as in his *Antolojía poética* (more conventionally spelt *antología*). This orthographic reformation was also adopted in Chile for some time, but since nobody else followed suit, the Chileans finally gave it up. One just has to memorize which words are spelled with *ge*, *gi* and which with *je*, *ji*.

b) Spanish orthography distinguishes between the two letters *b* and *v*. For (most) Spanish speakers, however, this orthographic distinction does not have any reality in their pronunciation: *beso* and *vaso* are pronounced /béso/ and /báso/, respectively, with the same sound. Similarly, the different spelling of the underlined sequences in *combate* 's/he fights' and *conversa* 's/he converses' is purely a matter of orthographic convention, since they are pronounced in exactly the same way.[2]

c) Nowadays, the great majority of Spanish speakers pronounce orthographic *y*, as in *yeso* 'plaster' and *ll*, as in *llama* 'flame; s/he calls; llama', in exactly the same manner, /ʝéso/, /ʝáma/. This is yet another case where the same phoneme is spelt in two different ways in different words. There was a time, however, when this orthographic distinction was a phonemically real one, and, in fact, there are still speakers both in Spain and in the Andean region of South America who pronounce the sound spelt *y* differently from the sound spelt with a double *ll*. For these speakers, *ll* represents a phoneme which sounds approximately like the English sequence *li* in *million* or, more accurately, like Italian *gli* (it is a PALATAL LATERAL, represented with the symbol /ʎ/ in IPA). Nevertheless, this distinction in pronunciation is rapidly disappearing even in the areas where it had been preserved until recently and it is normally not found any more in the speech of the youngest generations.

[2] Bilingual speakers whose other native language has a sound /v/, such as some English–Spanish speakers in the USA and some Catalan–Spanish bilingual speakers in Majorca and other areas, may have this phoneme in their Spanish, though. Some school teachers, especially in Latin America, also insist on artificially introducing a distinction in pronunciation between orthographic *v* and *b* as a way to aid in the memorization of the standard spelling of words.

Knowing which words are spelled with *y* and which with *ll* is thus another source of orthographic problems for most Spanish speakers.

d) Most speakers of Peninsular Spanish have a phonemic contrast between /s/ and /θ/, a sound similar to that in English *think*, *thorn* (a VOICELESS INTERDENTAL FRICATIVE). Standard Spanish orthography offers a straightforward representation of this phonemic contrast: /s/ is written as *s*, as in *sopa* 'soup', *casa* 'house', and /θ/ is written as *c* in the sequences *ce*, *ci*, as in *centro* /θéntro/ 'centre', *circo* /θírko/ 'circus', *Cecilia* /θeθília/, and as *z*, elsewhere, as in *caza* /káθa/ 'hunt', *zapato* /θapáto/ 'shoe', *zona* /θóna/ 'zone', *zurdo* /θúrdo/ 'lefthanded', *pez* /péθ/ 'fish', *piscina* /pisθína/ 'pool'. (The only anomaly is presented by some technical terms and proper names where the sequences *ze*, *zi* are used instead of *ce*, *ci*, as in *zinc* /θínk/, *zigzag*, *enzima* /enθíma/ 'enzyme' – compare with the homonymous *encima* /enθíma/ 'above' – *Zenón*, *zepelín* 'zeppelin'.) In standard Peninsular Spanish there are a number of /s/ - /θ/ MINIMAL PAIRS, that is, pairs of words that differ only in that one member of the pair has one phoneme and the other has the other: *ves* /bés/ 'you see', *vez* /béθ/ 'time'; *sien* /sién/ 'temple, side of the head', *cien* /θién/ 'a hundred'; *sima* /síma/ 'abyss', *cima* /θíma/ 'summit'; *sebo* /sébo/ 'lard', *cebo* /θébo/ 'bait', *abrasa* /abɾásа/ 'it burns', *abraza* /abɾáθa/ 's/he hugs', etc.

Speakers from all of Latin America, as well as the Canary Islands and parts of Andalusia, however, lack this phonemic contrast. For them, these words all contain the same phoneme, /s/: /sópa/, /kása/ (both *casa* and *caza*), /séntro/, /sírko/, /sesília/, /sapáto/, /sóna/, /súrdo/, /pés/, /pisína/, etc. For speakers lacking the phoneme /θ/ – that is, for the vast majority of native speakers of Spanish – the different ways to represent the phoneme /s/ in spelling is another major respect in which conventional orthography differs from pronunciation.

e) Finally, as already mentioned, the letter *h* is always silent in Spanish and does not represent any phoneme. The sequences *haber* 'to have' and *a ver* 'to see', for instance, are completely identical in pronunciation, /abér/.

Other than these relatively few complications, conventional Spanish orthography is phonemic.

The phonemes of the Spanish language are listed in Table 1.1, along with their representation in conventional orthography. The terms used to group these phonemes in classes will be explained in later chapters.

1.4 Phonemes and allophones

We noted above that Spanish, like all human languages, uses a rather small number of contrastive building blocks of sound or phonemes. A given phoneme is not always realized in the same manner, however. The pronunciation of all

Table 1.1 (Part I) Spanish phonemes and orthographic correspondences (General Latin American Spanish).

Phoneme	letter	examples
Vowels		
/a/	*a*	*casa* /kása/ 'house'
/e/	*e*	*mesa* /mésa/ 'table'
/i/	*i, y*	*pino* /píno/ 'pine', *y* /i/ 'and'
/o/	*o*	*copa* /kópa/ 'cup'
/u/	*u*	*cuna* /kúna/ 'cradle'
Plosive consonants		
/p/	*p*	*pelo* /pélo/ 'hair'
/b/	*b, v*	*boca* /bóka/ 'mouth', *vaca* /báka/ 'cow'
/t/	*t*	*toro* /tóro/ 'bull'
/d/	*d*	*dama* /dáma/ 'lady'
/k/	*c, qu, k*	*capa* /kápa/ 'cape', *queso* /késo/ 'cheese', *kilo* /kílo/
/g/	*g, gu*	*garra* /gáɾa/ 'claw', *guerra* /géɾa/ 'war'
Affricate consonants		
/t͡ʃ/	*ch*	*chico* /t͡ʃíko/ 'boy; small'
Fricative consonants		
/f/	*f*	*foca* /fóka/ 'seal'
/s/	*s, c(e,i), z**	*saco* /sáko/ 'bag', *cena* /séna/ 'supper', *escena* /eséna/ 'scene', *azul* /asúl/ 'blue'
/x/	*j, g(e,i), x*[a]	*jota* /xóta/ 'a dance', *gente* /xénte/ 'people', *mexicano* /mexikáno/ 'Mexican'
/ʝ/	*y, ll**	*yeso* /ʝéso/ 'plaster', *llano* /ʝáno/ 'flat'
Nasal consonants		
/m/	*m*	*mes* /més/ 'month'
/n/	*n*	*nada* /náda/ 'nothing'
/ɲ/	*ñ*	*año* /áɲo/ 'year'
Lateral consonants		
/l/	*l*	*loco* /lóko/ 'crazy'
Rhotic consonants		
tap /ɾ/	*r*	*coro* /kóɾo/ 'choir'
trill /r̄/	*rr, r*	*corro* /kór̄o/ 'circle', *rosa* /r̄ósa/ 'rose', *honra*[b] /ónr̄a/ 'honour'

Additional notes

[a] The letter *x* normally (but not always) represents the group /ks/: *taxi* /táksi/.

[b] Orthographic *h* does not represent any phoneme (it is silent): *harina* /aɾína/ 'flour'.

***Table 1.1 (Part II) Phonemic contrasts found only in some dialects.**

1. /s/ vs /θ/ Only in Northern-Central Peninsular Spanish (northern and central Spain)		
/θ/	*z, c(e,i)*	*cena* /θéna/, *escena* /esθéna/, *azul* /aθúl/
/s/	*s*	*saco* /sáko/ 'bag'
2. /ʝ/ vs. /ʎ/ Only in parts of Spain, the Andean region and Paraguay		
/ʝ/	*y*	*vaya* /báʝa/ 'that s/he/I go'
/ʎ/	*ll*	*valla* /báʎa/ 'fence'

sounds may depend on factors such as which other sounds it is in contact with, whether we are speaking fast or slowly, and the degree of formality in the speech situation. In fact, it is much closer to the truth to state that the same sequence of phonemes is never pronounced in exactly the same manner, not even in two repetitions of the same word by one speaker. For our purposes, we can safely ignore much of this variation (which is, on the other hand, very important for speech recognition engineers). Nevertheless, some aspects of variation are both systematic within a language and not necessarily found in other languages. It is with these linguistically significant aspects of variation in the realization of phonemes that we need to be primarily concerned.

Consider for instance the Spanish word *candado* 'lock'. In terms of phonemes we could write this as /kandádo/. Native Spanish speakers, however, pronounce the two instances of the phoneme /d/ in this word in quite different manners. For the first /d/, the tip of the tongue makes firm contact with the root of the upper teeth. This is what we will call a PLOSIVE or oral STOP consonant; a DENTAL plosive, since the contact is with the teeth. For the second /d/, on the other hand, there is no such firm contact. The tip of the tongue only approaches the teeth without adhering to them. Its articulation is that of an APPROXIMANT consonant (see 8.2.2).[3] In fact, between two vowels (and in some other contexts that we shall specify), Spanish /d/ is much more similar – although not completely identical – to the English *th* sound in words such as ***th**ough*, *ga**th**er*, *bro**th**er* (not the one in *think*!). We will use the symbol [ð] to represent this sound. We say that plosive [d] and approximant [ð] are two variants or ALLOPHONES of the phoneme /d/ in Spanish. Notice that we use brackets [] to represent allophones. We also use brackets in the transcription of whole words and sequences, when we go beyond phonemic distinctions to include

[3] In many books on Spanish phonology, this sound is classified as a 'fricative'. As explained in 8.2.2, the term 'approximant' is more accurate for the CONTINUANT allophones of /b d g/ in Spanish, whereas the English sound in *though*, *gather*, etc., is a fricative.

non-contrastive, allophonic details. We may say that the word /kandádo/ is normally pronounced [kandáðo], with two different allophones of /d/.

We have just said that all sounds are influenced by their environment, giving rise to allophonic variants. The amount of allophonic detail that we include in a phonetic transcription of an utterance will depend on which aspects of pronunciation we want to emphasize. A phonetic transcription that includes a lot of non-contrastive detail is called a NARROW PHONETIC TRANSCRIPTION, whereas a BROAD PHONETIC TRANSCRIPTION only includes a few details of particular interest.

In our example, /kandádo/, the first vowel would often present some nasalization under the influence of the following /n/. We could note this by including a nasalization diacritic over this vowel, [ã]. The phoneme /n/ would also normally modify its articulation becoming dental before dental /d/. This could also be indicated with a dental diacritic, a little tooth, under the segment, [n̪]. Finally, in the ending /-ado/ the approximant allophone of the phoneme /d/ is often given a very short duration, which we can indicate by means of a smaller superscript [ᵟ]. A narrower transcription of a typical rendition of /kandado/, including these details, would thus be [kãn̪dáᵟo] (we do not include the dental diacritic under [d] because this sound is always dental in Spanish). In general, our phonetic transcriptions will be fairly broad, among other things because, in this book, we are mostly interested in describing those features of Spanish pronunciation that will be common across speakers and contexts, rather than being interested in the minute details in which two renditions of the same sentence are different, for instance.

Going back to our example, Spanish speakers are not generally aware that they pronounce /d/ in two different ways, plosive [d] and approximant [ð], depending on the context. These are two systematically different, but non-contrastive, pronunciations of the same phoneme /d/. One reason why Spanish speakers may not be aware that they do not always pronounce /d/ in the same manner is that a word-initial /d/ will be pronounced as a plosive [d] in some contexts, including after a pause and after /n/, as in *con días* /kon días/ 'with days', pronounced [kon̪días], and as an approximant consonant [ð] in other contexts, including after a vowel, as in *para días* /para días/ 'for days', pronounced [paraðías]. The difference between [d] and [ð] is not contrastive in Spanish, but it is nevertheless systematic. A pronunciation such as [ládo], with a plosive [d], cannot be something different from [láðo], but it would be a funny way to say *lado* /ládo/ 'side'. Chances are that one would not be misunderstood by producing the wrong allophone, but only someone who is not a native speaker of the language would pronounce [ládo] instead of [láðo] in non-emphatic speech.

Table 1.2 Example of phoneme with two allophones in complementary distribution.

Phoneme	Allophones	Context
/d/	[d]	after pause, /l/ and /n/
	[ð]	elsewhere

The sounds [d] and [ð] are two allophones of the phoneme /d/ in Spanish which are found in COMPLEMENTARY DISTRIBUTION: one allophone, [d], occurs in certain environments (after pause, /n/ and /l/) and the other in all other phonological contexts (in the most widespread standard pronunciation).

To repeat, two allophones of a phoneme are said to be in complementary distribution when they occur in different contexts: one allophone occurs in a given environment or set of environments and the other is found elsewhere.

The Spanish phonemes /b/ and /g/ also have plosive [b], [g] and approximant [β], [ɣ] allophones in complementary distribution, as we can see in examples such as *ambos* [ámbos] 'both', *envía* [embía] 's/he sends' vs *sabe* [sáβe] 's/he knows', *lava* [láβa] 's/he washes', for phonemic /b/, and *tengo* [téngo] 'I have' and *lago* [láɣo] 'lake', for /g/. We will study this phenomenon in detail in Chapter 8.

English has two rather similar (although not identical) sounds to the two allophones of Spanish /d/, as in *dough* and *though*, respectively, but in English these are distinct phonemes. As we see, two sounds that are allophonic realizations or variants of the same phoneme in one language can be separate phonemes in another language.

To give another example comparing Spanish and English, in English there is a contrast between a phoneme /s/ that occurs in ***S**ue*, *ri**c**e*, and another phoneme /z/ in words such as ***z**oo*, *ri**s**e*. The existence of these MINIMAL PAIRS shows that /s/ and /z/ are indeed distinct phonemes in English. Both sounds also occur in Spanish, but with a very different status: the sound [z] is simply a possible realization of /s/ before certain consonants (before VOICED consonants) as in *desde* /désde/ [dézðe] or [désðe] 'from', *mismo* /mísmo/ [mízmo] or [mísmo] 'same'. It does not occur anywhere else in the language. We conclude that in Spanish the sound [z] is not a distinct phoneme, but only an allophonic variant of the phoneme /s/ in a specific environment.

Let us consider one more example of two sounds that are simple allophones of the same phoneme in Spanish but different phonemes in English. Many Spanish speakers (for instance in Andalusia, the Caribbean and Peru) pronounce final *-n* as in *pan* 'bread', *atún* 'tuna fish', with the final sound found in English