# CHAPTER 5

# Phonological processes

## 5.1 Introduction

The phonological systems of different languages are obviously different. No two languages have exactly the same inventory of phonemes which are realised by the same set of allophones; no two languages have exactly the same phonological rules regulating the deployment of their sounds. However, while all that is true, it would be wrong to ignore the similarites between languages because they are no less impressive than the differences. In the discussion of phonological symmetry in Chapter 2, we noted that languages tend to exploit the same phonetic parameters in building their phonological systems and that there are certain patterns that recur frequently.

In Chapter 3 we observed that it is feasible to use a relatively small number of DISTINCTIVE FEATURES like [± back], [± high], [± low], [± round], [± voice] etc. to characterise the phonological contrasts found in all the world's languages. One possible explanation for this is the fact that human anatomy and physiology impose limits on the range of sounds which people can produce as speakers and discriminate as hearers. Thus, for instance, since no human is endowed with a tongue which is so long that the tip can curl all the way back to the throat, it is safe to predict that no language has apico-uvular consonants made with the tip of the tongue and the uvula as the articulators (the uvula is the fleshy bit that hangs down from the centre of the soft palate at the very back of the mouth). On the other hand, given the ease with which the tip and the blade of the tongue can be raised towards the upper front teeth and the teeth ridge, it is not surprising to discover that all

languages have either dental or alveolar sounds, if not both. Distinctive feature theory claims that there is a universal inventory of phonological construction materials from which various languages chose different elements which they use in building their phonological systems. Alternatively, distinctive features can be likened to cooking ingredients on a supermarket shelf. The selection of ingredients that a particular language puts in its shopping basket depends on the recipe which it wishes to concoct. (Of course, I do not mean this in a literal sense. Languages cannot be credited with intentional behaviour!)

It is significant, but not unexpected, that the phonological recipes which are available fall within the range permitted by human biology. What is intriguing is the fact that not everything that is biologically possible is equally likely to occur. Within the range of possible sounds, certain articulatory parameters are exploited by languages much more commonly than others.

Furthermore, besides exhibiting similarities in the features they use in structuring their sounds, languages also show other phonological similarities. For example, although the phonological systems of different languages are governed by different rules, the variation which occurs does, for the most part, fall within certain parameters. Similar phonological processes turn up, in language after language.

## 5.2 Assimilation

In Chapter 2 we saw that often in language a phoneme has several allophones, with the allophone selected in a particular position being dependent on the other sounds that are adjacent to it. The commonest phonological process responsible for this is ASSIMILATION. Assimilation, as you will recall from the discussion in Chapter 3, is the modification of a sound in order to make it more similar to some other sound in its neighbourhood. The advantage of having assimilation is that it results in smoother, more effortless, more economical transitions from one sound to another. It facilitates the task of speaking. The speaker usually tries to conserve energy by using no more effort

than is necessary to produce an utterance. (Guardians of linguistic good taste in a speech community might view many instances of assimilation as nothing less than culpable sloppiness. But their admonitions 'to uphold standards' tend to go largely unheeded.)

Usually, the alternation in the phonological realisations of a MORPHEME (i.e. minimal meaningful or distributional unit in a language, which may be a simple word like *dog*, or a suffix like the *-s* plural marker in *dog-s*, or the negative prefix *un-* in *un-do*) can be accounted for in terms of assimilation.

Consider the regular plural ending in English. It is written as *s*, but it may, in fact, be pronounced as [-s] as in [pet-s] *pets*, or as [-z] as in [bel-z] *bells* or even as [-ɪz] as in [rəʊz-ɪz] *roses*. The choice is not random. The principle that determines the shape of the suffix is VOICE ASSIMILATION: this suffix must always agree in voicing with the preceding sound. Turning voicing on and keeping it on throughout, or alternatively, not turning voicing on at all is much easier than the alternative of turning it on or off part-way through a sequence of sounds.

More data is provided in [5.1] to illustrate the pattern of alternation of the plural ending. Study the data and answer the questions which follow:

[5.1] English Plural Formation

| A | | B | | C | |
|---|---|---|---|---|---|
| Singular | Plural | Singular | Plural | Singular | Plural |
| dog | dogs | dock | docks | witch | witches |
| bid | bids | bit | bits | nose | noses |
| rib | ribs | tip | tips | marsh | marshes |
| love | loves | giraffe | giraffes | badge | badges |
| sea | seas | moth | moths | bus | buses |

(a) Add five more examples of your own to each column.

(b) Suggest a rule to predict the shape of the ALLOMORPH (i.e. alternative realisation of the morpheme) that occurs with the nouns in each column.

If you have answered [5.1] correctly, you have established that the English plural suffix has the following allomorphs:

[5.2]   (i)   [-z]    occurring with the words in column A

        (ii)  [-s]    occurring with the words in column B

        (iii) [-ɪz]   occurring with the words in column C

Typically, as these examples show, the alternation in the shape of a morpheme is not arbitrary. Rather, it is PHONOLOGICALLY CONDITIONED. This means that the allomorph of a morpheme that occurs in a given context is partly or wholly determined by the sounds found in the allomorphs of adjacent morphemes. It is not merely coincidence that is responsible for the allomorphs of the plural morpheme and the third person plural being [-z -s -ɪz]. The suffix AGREES IN VOICING with the preceding sound. We shall provisionally state the rule thus:

> the plural suffix is realised by a voiced or voiceless alveolar fricative depending on whether the noun ends in a voiced or voiceless segment. (The rule will be embellished presently to take into account the forms in column C.)

Note that this voice assimilation is not an idiosyncratic property of the plural morpheme. It is a rule that applies more generally to English suffixes consisting of plosives or fricatives (i.e. obstruents). For instance, the /-z/ suffix, whether it is the noun plural marker as in [5.1], or the third person singular present tense suffix, shows the same pattern of alternation. You can verify this by examining [5.3]:

[5.3] English third person singular present tense suffix

|  | A |  | B |  | C |
| --- | --- | --- | --- | --- | --- |
| see | sees | paint | paints | teach | teaches |
| love | loves | hate | hates | wish | wishes |
| rub | rubs | talk | talks | judge | judges |
| mend | mends | make | makes | kiss | kisses |
| come | comes | laugh | laughs | rise | rises |
| call | calls | wipe | wipes | lose | loses |
| know | knows | keep | keeps | catch | catches |

Instead of listing separately the three allomorphs of the plural morpheme and those of the third person singular present tense morpheme (and for that matter, of any other regular, phonologically conditioned morpheme in any language), we can posit a single UNDERLYING REPRE-SENTATION (or BASE FORM) which is entered in the 'DICTIONARY'. The various allomorphs can be derived by rule from that underlying representation.

In this case, if we assume that the base form of the noun plural suffix is /-z/, and if we further assume that the base form of the third person singular present tense morpheme is also /-z/, we can derive the various allo-morphs of each morpheme using the informal VOICE ASSIMILATION rules in [5.4]:

[5.4]  English voice assimilation

    (i)   The underlying, dictionary representation of the plural and of the third person singular present tense markers is /-z/.

    (ii)   Insert [ɪ] (or [ə]) after any root ending in a sibilant (i.e. a sound such as [s z ʃ tʃ dʒ] which has high pitched fricative noise). See words like *witch* in column C in (5.1).

    (iii)   Make sure that the suffix agrees in voicing with the segment preceding it. After a voiceless segment, like the final [k] of *dock*, the underlying /-z/ is changed to [s] so that the root and the suffix become more similar: /dɒk-z/ → [dɒk-s]. See words in column B in (5.1).

    (iv)   After a root that ends in a voiced segment like a vowel or like the voiced stop /g/ in *dog* the suffix is realised as [z], which is also voiced, i.e. the underlying /-z/ in that case surfaces unmodified:
/dɒg-z/ → [dɒgz]
See the words in column A in (5.1).

    (v)   Likewise, after the vowel [ɪ] has been inserted after roots ending in a sibilant, the underlying /-z/ is realised as [z] so that it agrees in voicing with [ɪ]:
/wɒtʃ/ → [wɒtʃ-ɪ/ → [wɒtʃ-ɪz/.
See words in column C in (5.1).

In the next section we shall explore some general issues regarding assimilation before returning to voice assimilation in 5.3.3 below.

## 5.2.1 Direction of assimilation

When discussing assimilation, it is useful to look at processes in terms of DIRECTIONALITY, i.e. we can say whether a sound becomes more like either the sound that **precedes** it or the sound that **follows** it. If a sound becomes more like the sound that precedes it, the process is called REGRESSIVE assimilation; if, on the other hand, a sound is modified so that it becomes more like the sound that follows it, the process is called PROGRESSIVE assimilation.

In all the English examples above, the suffix consonant is made to agree in voicing with the root segment that precedes it. Hence, the rule of suffix voice agreement is an instance of regressive assimilation.

Now consider the following examples from Luganda (Uganda) and determine the direction of assimilation.

| [5. 5]m-bala | I count | n-tema | I cut |
|---|---|---|---|
| m-pa | I give | ɲ-ɟagala | I like |
| m-mala | I finish | ɲ-ɲumya | I converse |
| n-daga | I show | ɲ-coppa | I become destitute |
| n-sika | I pull | ŋ-kola | I work |
| n-neɲa | I blame | ŋ-gula | I buy |

You will have observed how, in these data, the nasal always shares the place of articulation of the consonant that follows it. Anticipating the place of articulation of the following consonant, the speaker adjusts the place of articulation of the nasal. The direction of assimilation in [5.5] is PROGRESSIVE (also called ANTICIPATORY):

[5.6] The nasal is realised as
  (i)  [m] before bilabial consonants (e.g. when one of [p b m] follows)

(ii)    [n] before alveolar consonants (e.g. when one of [t d n s] follows)

(iii)    [ɲ] before palatal consonants (e.g. when one of [c ɟ ɲ] follows)

(iv)    [ŋ] before velar consonants (e.g. when [k or g] follows)

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Stop reading and write down at least two fresh examples from English (or any other language you know) which exemplify progressive and regressive assimilation.

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Examine the data [5.7], again taken from Luganda, and determine whether the direction of assimilation is progressive or regressive.

[5.7]    A                          B

βakulagrab! (imp.)         m-bakula    I grab
βalacount! (imp.)          m-bala      I count
ka-βuzismall goat          m-buzi      goat
ka-βogo small buffalo      m-bogo      buffalo

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The process whereby the nasal is altered to agree in place of articulation with the **following** consonant must be viewed as anticipatory (i.e. progressive) assimilation. However, if you examine the data closely, you will observe that there is another process going on at the same time. The bilabial fricative [β] alternates with a plosive: the fricative occurs word initially (see column A) while the plosive [b], which shares the same places of articulation, occurs after a nasal (see column B). The fricative, which is a continuant, assimilates the property of being noncontinuant (i.e. being a stop) from the nasal immediately preceding it.

What [5.7] shows is BIDIRECTIONAL assimilation. The nasal prefix assimilation rule which ensures that all nasals have the same place of articulation as the **following** consonant exemplifies progressive assimilation; but the STRENGTHENING of continuants so that they are realised as stops when they are **preceded** by a nasal stop is an example of regressive assimilation.

## 5.3 Assimilation processes

Another way in which assimilation processes can be seen is in terms of whether a vowel or consonant acquires vowel or consonant features of a neighbouring segment. Various patterns are examined in turn below. The coverage is not intended to be exhaustive. It is only meant to show some of the commonest assimilation processes found in the languages of the world.

### 5.3.1 Palatalisation

Say the following words and describe the position of your tongue during the production of the first consonant in each one of them:

[5.8] key   [k̟i] car [kɑ]          then say:  [kɑ k̟iz]
      keep  [k̟ip] calm [kɑm]                   [k̟ip kɑm]
      get   [get] garlic [gɑlɪk]                [get gɑlɪk]
      give  [g̟ɪv] guns [gʌnz]                   [g̟ɪv gʌnz]

Observe that, in each case when a velar consonant is followed by a front vowel, there occurs some slight anticipatory fronting of the part of the tongue that makes contact with the roof of the mouth. This fronting is indicated by a subscript (₊) under the consonant. The effect of the fronting is that the velar consonant is made partly in the palatal region. This process is called PALATALISATION. Velar consonants often have slightly palatalised allophones which occur after front vowels because the tongue is raised towards the hard palate in the production of front vowels and speakers anticipate that gesture and start making it before they have completed the articulation of [k] or [g].

Palatalisation is not limited to velar consonants. It is equally possible to palatalise anterior consonants. In fast, causal spoken English, for instance, alveolar consonants are usually palatalised when they occur at the end of a word and are followed by another word which begins with an alveopalatal consonant:

[5.9] his shoes     [hɪz ʃuz]    → [hɪʒ ʃuz]
      nice shirt    [naɪs ʃɜt]   → [naɪʃ ʃɜt]
      miss Ure      [mɪs juə]    → [mɪʃ juə]
      John's shorts [dʒɒnz ʃɔts] → [dʒɒnʒ ʃɔts]

Now use the notion of palatalisation to help account for the alternative pronunciations of the words in [5.10].

| [5.10] | A | B | C |
|---|---|---|---|
| issue | [ɪsju] | ~ [ɪʃju] | ~ [ɪʃu] |
| consume | [kənsjum] | ~ [kənʃjum] | ~ [kənʃum] |

Add at least two more examples of your own.

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If the forms in A are taken as the CITATION FORMS that would be listed in a dictionary, B can be explained as a case of palatalisation. The speaker, anticipating the palatal approximant which follows, places the tongue in the alveo-palatal region instead of the alveolar region. In C the speaker once again anticipates the palatal approximant and has the tongue making contact with the alveo-palatal region and drops the [j] sound which triggered off the palatalisation in the first place.

## 5.3.2 Labialisation

Palatalisation is not the only vowel feature which can be acquired by consonants. Say the words in [5.11] and then get another person to say them. Watch your partner's lips very carefully. Describe the lip position adjustment process which you observe as the initial consonant of each pair of words in A and B is said.

| [5.11] | A | | B |
|---|---|---|---|
| peel | [pil] | pool | [pʷul] |
| tea | [ti] | two | [tʷu] |
| she | [ʃi] | shoe | [ʃʷu] |
| leek | [lik] | Luke | [lʷuk] |
| get | [get] | got | [gʷɒt] |

In each case, the word in B is said with some degree of secondary lip rounding. Anticipating the next segment, which is a rounded vowel, the speaker starts rounding the lips before the articulation of the consonant is completed. This assimilation process is called LABIALISATION or (ROUNDING). It can be indicated in a phonetic transcription by using the raised ᵂ after a consonant [Cʷ].

Find two examples of labialisation in any language you know and write them down using a narrow phonetic transcription.

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### 5.3.3 Voice assimilation

You will remember that in section 5.2 of this chapter we saw that in English suffixes agree in voicing with the last segment of the stem to which they are attached. That is a classic example of VOICE ASSIMILATION: whatever happens to be the specification for the feature [voice] of the preceding segment of the root is automatically carried over into the suffix. The relevant examples are not repeated here. If you want to refresh your memory, please read section 5.2 again.

The phonetic cause of voice assimilation is well-understood. Given the fact that speech is a continuum, the process of putting the vocal cords close together to produce voicing or keeping them wide apart to produce voicelessness is not always perfectly synchronised with other articulatory gestures. This may mean voicing spilling over into an adjacent segment. This frequently happens where a voiceless consonant occurs between two (voiced) vowels. In many languages, in that position, 'voiceless' consonants acquire a certain amount of voicing. This happened historically as Spanish developed from Latin. One of the changes that occurred was the voicing of voiceless stops between vowels. For instance, Latin *fata* 'fate' became *fada* in Spanish. The converse situation is also attested. In some languages a vowel is devoiced when it occurs between voiceless consonants. That is the case in Japanese in a word like [k̥ita] 'came'.

Cast your mind back to the French problem in Chapter 2. The data is reproduced below for convenience. Recall that in French, at the end of a word the LIQUIDS (i.e. /l/ and /r/) as well as the nasals agree in voicing with the preceding consonant: they are voiced after voiced consonants (as in [5.12]), and voiceless after voiceless ones (as in [5.13]):

[5.12] French voice assimilation: word final nasals and liquids are voiced after a voiced segment.

matinal    'morning' (adj.)
li:r       'to read'
film       'film'
tabl       'table'

[5.13] French voice assimilation: word final nasals and liquids are voiceless after a voiceless segment.

metr       'to put'
tãpl       'temple'
ʃifr       'figure'
rymatism   'rheumatism'

Examine the data in [5.14] and describe the rule responsible for the voice assimilation in Kalenjin (Kenya) (Toweett 1975).

[5.14] kep    to notch    kebe:t    is notching
       nap    to sew      nabe:t    is sewing
       luk    to fight    luge:t    is fighting
       ku:t   to blow     ku:te:t   is blowing

There is a twist in the data. While labial [p] and velar [k] acquire voicing in intervocalic position, alveolar [t] does not. It remains voiceless between vowels.

## 5.3.4 Place of articulation assimilation

We saw in [5.6] that in Luganda the place of articulation of a nasal is predictable from the place of articulation of the consonant that comes after it.

Now apply the same kind of analysis to the Malay data in [5.15] and state the distribution of the allomorphs of the agentive nominalising prefix /pəŋ/. This prefix can be attached to most verbs to form a noun with a meaning similar to that of a noun derived from a verb in English using the -er suffix.

[5.15] Malay (Dodds 1977)

| baca | read | pəmbaca |
| bəli | buy | pəmbeli |
| bərənan | swim | pəmbərənan |
| dənar | hear | pəndənar |
| dakwa | prosecute | pəndakwa |
| cakap | speak | pəɲcakap |
| curi | steal | pəɲcuri |
| gosok | polish | pəŋgosok |
| gali | dig | pəŋgali |

In [5.15], the nasal is HOMORGANIC with the consonant that goes after it, i.e. the nasal shares the place of articulation of the following consonant. Hence the use of the label HOMORGANIC NASAL ASSIMILATION to refer to this assimilation process. The homorganic nasal assimilation rules which were suggested for Luganda in [5.6] would also cover Malay. In both languages the assimilation is automatic. It applies wherever a nasal is followed by another consonant in the same word.

Homorganic nasal assimilation also applies in English, albeit somewhat sporadically. Compare the two columns in [5.16] which show the negative prefixes *in-* and *un-* respectively:

[5.16]             A                          B
        [ɪn] in-appropriate        [ʌn] un-exciting
        [ɪm] im-plausible          [ʌn] un-pretentious
        [ɪn] in-decent             [ʌn] un-deserving
        [ɪŋ] in-gratitute          [ʌn] un-grateful

Add three fresh examples to each column, choosing a different consonant after the prefix, but avoiding the prefixes *ir-* and *il-* (see next section). Say carefully each word that you add to the list, noting the changes in the place of articulation of the nasal in column A in anticipation of the place of articulation of the consonant that follows. Assume that the underlying representation of the prefix in A is *in-* since that is the form that appears before vowels, a position where there is no phonetic motivation for

modifying the place of articulation (given the fact that vowels have no place of articulation).

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Homorganic nasal assimilation is not an automatic and obligatory rule of English phonology. It applies selectively to certain forms and is not triggered by phonological information alone. There are words which contain nonhomorganic nasals. The homorganic assimilation rule normally applies to *in-* but not to *un-*, except in casual speech where, for example, *unkempt* and *unpleasant* may be pronounced [ʌŋkempt] and [ʌmplezənt] respectively.

It is interesting that across word boundaries, in fast speech, consonants (especially alveolar ones), can be optionally homorganic with the following consonant. There, no grammatical restrictions seem to apply:

[5.17] bad man    [bæd mæn] → [bæb° mæn]
　　　 ten men　  [ten men] → [tem men]
　　　 what car　 [wɒt kɑ] → [wɒk° kɑ]
　　　 top ten　　[tɒp ten] → [tɒt° ten]
　　　 (C° = unreleased stop: normally there is no audible release of a stop followed by another stop.)

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Find two more examples of assimilation similar to those in [5. 17].

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## 5.3.5 Manner of articulation assimilation

In the last section we established that the underlying representation of the negative prefix which occurs with adjectives in [5.16] must be *in-*. If that assumption is correct, how can we explain the historical development shown in [5.18]?

[5.18] in-legal　　　 → illegal
　　　 in-licit　　　→ illicit
　　　 in-rational　　→ irrational
　　　 in-revocable　 → irrevocable

The answer seems to be that before roots whose first consonant is a LIQUID (/l/ or /r/) the nasal of the negative prefix assimilates the manner of articulation features of the liquid so that /n/ becomes [l] before /l/-commencing roots or [r] before /r/-commencing roots. However, this alternation is not purely phonetically conditioned since [n] can be followed by [l] or [r] in words such as *unloved* or *unreasonable*. In fact, this is a historical assimilation which took place in Latin, and is simply reflected in modern English through Latin borrowing.

An example of a manner of articulation assimilation rule which is still active in a contemporary language is given in the Cairo Arabic data in [5.19]. The underlying representation of the definite article is /il-/. However, it is not realised as [il-] in all contexts. Whether it is realised as [il-] or as something else depends on the first consonant of the root to which it is prefixed.

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Study [5.19] and suggest a rule to account for the realisation of the definite article.

Here is a clue: the definite article is realised as [il-] unless the noun to which it is attached shares some place of articulation features with /l/.

[5.19] Cairo Arabic (Harms 1968)

| kursi | 'chair' | ilkursi | 'the chair' |
|-------|---------|---------|-------------|
| dars | 'lesson' | iddars | 'the lesson' |
| innimra | 'the grade' | ilmudarris | 'the teacher' |
| issatr | 'the line' | ilwa:gib | 'the assignment' |
| ilba:b | 'the door' | ilqism | 'the section' |
| issanta | 'the bag' | ilge:b | 'the pocket' |

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We could state the rule this way informally:

the [l] of the definite article takes on the manner of articulation features of the initial root consonant and becomes indistinguishable from it, where like [l], that consonant is anterior and coronal (i.e. made at the alveolar place of articulation).

The motivation for this kind of change is not difficult to see. Ensuring that segments made at the same place also

agree in manner of articulation is a way of minimising articulatory effort. Instead of making two articulatory gestures the speaker only makes one and holds it for a longer period.

## 5.3.6 Nasalisation

NASALISATION is a process whereby an oral segment acquires nasality from a neighbouring segment. Again, the articulatory motivation for this is self-evident. In order to produce a nasal segment, it is necessary to lower the velum (soft palate) and allow air to escape through the nose (the lower the soft palate is, the higher will the degree of nasalisation be); to produce an oral sound, it is necessary to completely block off access to the nasal cavity by raising the velum as high as it can go. Any leakage of air past the velum will cause some nasalisation. To maintain an absolute distinction between oral and nasal consonants would require perfect synchronisation of velic closure with the other articulatory parameters of (a) PHONATION (i.e. production of voicing), (b) the PLACE OF ARTICULATION and (c) the MANNER OF ARTICULATION. This is not always possible. Typically some nasalisation seeps through and affects an oral segment which is adjacent to a nasal. In many languages the nasalisation is prominently audible. Examples of nasalised vowels ($\tilde{V}$) are the sound [ɛ̃] and [ã] in the French words [pɛ̃] *pain* 'bread' and [mãmã] *maman* 'mum'.

In Kikuyu (Kenya), vowels have nasal variants which occur in the neighbourhood of nasal consonants, as you can see in [5.20]:

[5.20] Kikuyu nasalisation (Leakey 1959)

| mõndu | person | tato | three |
|---|---|---|---|
| mõãnake | young man | ihiɣa | stone |
| nyɔ̃ni | bird | iðə | father |
| ŋgõlo | heart | koɣolo | foot |
| kehẽmbe | drum | oholo | news |

Historically it is almost certain that nasalisation is always a consonant feature which is assimilated by vowels. However, in a synchronic description of a language it is possible to find vowels which are always nasal and which

must be presumed to be underlyingly nasal. That is the case in Yoruba (Nigeria) where nasal vowels occur in the absence of nasal consonants in words like [odū] 'year'. At one time there would have been a nasal consonant conditioning the vowel nasalisation but it has disappeared.

## 5.4 Dissimilation

We have seen in the preceding section of this chapter that assimilation processes typically have a transparent phonetic basis that can be stated in terms of ease of articulation. But not all phonological processes can be plausibly explained in terms of assimilation. If we recognise the fact that phonological systems have to meet the needs of language users both as speakers and as hearers, we can easily appreciate that while assimilation (by making sounds more similar to each other) facilitates speech production, it does also have the undesirable effect of making the hearer's task of discriminating between sounds somewhat more difficult.

 Phonological processes which ensure that differences between sounds are enhanced so that sounds become more auditorily distinct make speech perception easier. DISSIMILATION is the term used to refer to processes of that kind. The effect of dissimilation is to make sounds more distinct from other sounds in their environment. After a dissimilation rule has applied, phonological elements are less like each other than they were before the rule applied.

Let us begin by examining a very limited set of data from English which illustrates dissimilation. In English, the adjective forming suffix -al has two phonetic manifestations. Sometimes it is -al, as in column A in [5.21] below and sometimes it -ar, as in column B. Bearing in mind the fact that dissimilation plays a role in this, study the data and describe the factor which determines the allomorph that occurs in any particular instance. Pay special attention to the last segment of the noun which is adjacent to the adjective ending. Say the words aloud and transcribe the final segment phonetically.

[5.21]

| noun | adjective | noun | adjective |
|------|-----------|------|-----------|
| electric | electrical | angle | angular |
| region | regional | circle | circular |
| orbit | orbital | table | tabular |
| baptism | baptismal | circle | circular |
| genitive | genitival | title | titular |
| culture | cultural | single | singular |

The pattern is clear. The shape -*al* is the base form. It is the form which you add in column A where the last consonant of the noun is a sound other than [l]. Verify this by looking at the transcription which you have made. The shape -*ar* is the alternant which is normally added where the last consonant of the noun is [l]. The addition of -*al* after a root ending in [l], which would have resulted in two [l] sounds merely separated by a schwa, is thus avoided. But like many other rules, this rule has exceptions, e.g. *linear* not *\*lineal* although *line* does not end in -*l*.| (Note also in passing that in column B, [ju] is inserted between the final [l] and the consonant preceding it.)

The English dissimilation process is another Latin relic. It survives in words borrowed from Latin but is not a productive rule. It is often difficult to know where to draw the line between a synchronically relevant phonological process and a historical relic which is no longer relevant. We shall return to this problem in Chapter 8.

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For our next example we shall consider a productive synchronic dissimilation process. In many Bantu languages there is a rule which requires a consonant in a prefix to DISAGREE in voicing with the first consonant of the root to which it is attached:

a voiced stem initial segment requires a voiceless consonant in the prefix and a voiceless stem-initial segment requires a voiced consonant in the prefix.

Consider the Kirundi (Burundi) examples in [5.22]:

[5.22] (Kirundi dissimilation (Kenstowicz and Kisseberth 1977)

a.  *Imperative*            *1st person singular present*
    rya      eat            tu-rya

|       | mwa    | shave     | tu-mwa    |
|-------|--------|-----------|-----------|
|       | va     | come from | tu-va     |
|       | bona   | see       | tu-bona   |
| b.    | soma   | read      | du-soma   |
|       | te:ka  | cook      | du-te:ka  |
|       | seka   | laugh     | du-seka   |
|       | kubita | hit       | du-kubita |

This dissimilation rule in Bantu is called Dahl's law, after the scholar who first described it.

## 5.5 Conclusion

In this chapter a number of common phonological processes have been examined. It has been shown that there are often good phonetic reasons for phonological processes. For the most part, phonological alternation in the shape of a morpheme has a phonetic motivation and that motivation tends to be similar in different languages. This largely explains the considerable degree of similarity between the phonological patterns found in different languages.

*Exercise*

1.  Before attempting this question read [5.2] again. Next do the following:
(a) Make a broad phonetic transcription of the English data in example [5.1] above.
(b) Propose a rule which predicts the shape of the genitive suffix which goes with each one of the nouns in [5.1].

2.  Study the data below showing the realisation of the regular past tense ending in English:

| *present* | *past*    | *present* | *past*   |
|-----------|-----------|-----------|----------|
| walk      | walked    | paint     | painted  |
| look      | looked    | want      | wanted   |
| trap      | trapped   | part      | parted   |
| wish      | wished    | fit       | fitted   |
| laugh     | laughed   | court     | courted  |
| watch     | watched   | land      | landed   |
| launder   | laundered | sound     | sounded  |
| arm       | armed     | fade      | faded    |

| warn | warned | pad | padded |
| sue  | sued   | row | rowed  |

(a) Make a broad phonetic transcription of the data above.
(b) Suggest a rule to account for the realisation of the regular past tense ending.
(c) Make a single statement to account for the realisation of both the plural suffix and the past tense suffix.