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Consonantal Gestures



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Consonantal Gestures

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The movements of the lips and tongue in English are only a small subset of those that can be used for making consonants. Scores of other sounds can be made, as we will see by considering different languages. An appropriate way to describe consonantal gestures in the languages of the world is in terms of two of their aspects: the targets of the gestural movements, commonly called the places of articulation, and the way in which the target is approached, often thought of as the manner of articulation. We will use these traditional terms, but always remembering that speech sounds involve gestural movements, not static positions of the vocal organs. Consonants that occur in other languages are well worth studying even by those concerned mainly with the phonetics of English. Many of the sounds that occur in other languages also occur in regional, accented, or disordered varieties of English. As we noted at the beginning of the previous chapter, the best way to study unfamiliar sounds is by observing them in languages in which they are a regular, easily observable part of the sound system. Articulatory targets Many of the possible places of articulation that are used in the languages of the world were defined in Chapter 1. Figure 7.1, which is similar to Figure 1.5, shows three

additional places that will be discussed below. The terms for all the places of articulation are not just names for particular locations on the roof of the mouth. They should be thought of as names for the numbered arrows. Each term specifies where the arrow starts (the articulator on the lower surface that makes this particular gesture) and where it ends (the part of the vocal tract that is the target of the gesture). A large number of non-English sounds are to be found in other languages. Many of them involve using gestures in which the target, or the place of articulation, is different from any found in English. For others it is the type of gesture, what is traditionally called the manner of articulation, that is different. We will illustrate the different targets by considering how each place of articulation is used in English and in other languages for making stops, nasals, and fricatives. The numbers in the following paragraphs refer to the numbered arrows in Figure 7.1.

173 Created from ybp-ebookcentral on 2020-03-21 08:16:34. 111 Chapter 7 CCCCCCCCCC CCCCCCCC Figure 1.1 Places of articulation. EXAMPLE 7.1 EXAMPLE 7.2 (1)

The bilabial gesture is common in English, which has bilabial stops and nasals [p, b, m]. But bilabial fricatives in English are simply allophones of the labiodental sounds [f, v]. In some languages (e.g., Ewe of West Africa), bilabial fricatives contrast with labiodental fricatives. The symbols for the voiceless and voiced bilabial fricatives are [F, B]. These sounds are pronounced by bringing the two lips nearly together, so that there is only a slit between them. In Ewe, the name of the language itself is [”~B”~], whereas the word for two is [”~v”~]. Try to pronounce these contrasting words yourself. Ewe also contrasts voiceless bilabial and labiodental fricatives. Contrasts involving all these sounds are shown in Table 7.1. We should also note here some other labial sounds not shown in Figure 7.1. A few Austronesian languages spoken in Vanuatu have linguo-labials, in which the tongue touches the upper lip. V’enen Taut has nasals, stops, and fricatives made in this way. The diacritic for indicating a linguo-labial articulation is [£], a shape like a seagull,

placed under the coronal symbol. The V'enen Taut for "breadfruit" is [tʔatei], and for "stone" is [naDʔat]. These and other V'enen Taut sounds are on the website. (2) Many languages are like English in having the labiodental fricatives [f, v]. But probably no language has labiodental stops or nasals except as allophones of the corresponding bilabial sounds. In English, a labiodental nasal, [M], may

aCCAACCCCCCA tCCACCC 111 Table 1.1 Contrasting bilabial and labiodental fricatives in Ewe. Voiceless bilabial fricative e!Fa! e!Fle~ 'he polished' Voiceless labiodental fricative Voiced bilabial fricative Voiced labiodental fricative e!Fa! 'he was cold' ~B~ 'Ewe' (the language) ~v~ 'two' 'he bought' e!fle! ‡ 'he spit off' e!Blo! 'mushroom' e!vlo! 'he is evil' occur when / m / occurs before / f /, as in emphasis or symphony. Say these words in a normal conversational style and see if your lower lip ever contacts your upper lip during the nasal. Some languages have affricates in which the bilabial stop is released into a labiodental fricative. Practice these sounds by learning to say the German words Pfanne ["pfanE] 'bowl' and Pflug [pfluk] 'plough.'

(3) Most speakers of both British and American English have dental fricatives [T, D] but no dental stops, nasals, or laterals except allophonically before [T, D], as in eighth, tenth, wealth [e!t1T, tEn1T, wEl1T]. Many speakers of French, Italian, and other languages typically have dental stops, nasals, and laterals. In these languages, [t1, d1, n1] are not just coarticulated allophones that occur only before [T, D], as in English. However, there is a great deal of individual variation in the pronunciation of these consonants in all these languages. According to a careful palatographic study, around one-third of Californian English speakers have dental stops, and many French speakers have alveolar rather than dental consonants—well over half of them in the case of the lateral / l /. Say words such as tip, dip, nip, lip and try to feel where your tongue touches the roof of your mouth. Some languages, such as Malayalam, a Dravidian language spoken in southern India, contrast dental and alveolar consonants.

Examples of contrasting Malayalam nasals are shown in Table 7.2. The table also includes other consonantal gestures that are used in Malayalam but not in most forms of English. We will discuss these in subsequent paragraphs. (4) Alveolar stops, nasals, and fricatives all occur in English and in many other languages. They need no further comment here. (5) Retroflex stops, nasals, and fricatives do not occur in most forms of English. The outstanding exception is the English spoken in India. Retroflex sounds are made by curling the tip of the tongue up and back so that the underside touches or approaches the back part of the alveolar ridge. The symbols used by IPA for retroflex sounds include [ʈ, ɖ, ɳ]. Remember that, just as dental is a gesture that can be defined as an articulator (the tip of the tongue) and a target (the upper teeth), so also retroflex describes a gesture involving the underside of the tip

EXAMPLE 7.3 171 Chapter 7 CCCCCCCCCC CCCCCCCC tAble 7.2 Contrasts involving bilabial, dental, alveolar, retroflex, palatal, and velar places of articulation in Malayalam, illustrating the necessity for six points of articulation. As we saw in Chapter 3, dental articulations are indicated by a subscript [1]. Bilabial Dental Alveolar kØmmi ‘ChCCCCAC’ Retroflex kØ==i ‘CAcK AC AhCAC’ pØnlnli ‘pAA’ Palatal kØ≠≠i ‘bCACcd CAAC CCd wCCCC’ kØnni ‘fACCC’ Velar kuNNi ‘ACcChCd’ of the tongue and a target, the back of the alveolar ridge. Students sometimes imagine that the term retroflex describes a manner of articulation, but in fact it is a place of articulation like dental and alveolar. At each of these places of articulation, it is possible to produce stops, nasals, fricatives, and sounds made with other manners of articulation. As we saw in Tables 6.2 and 6.7, the languages Sindhi and Hindi contrast several types of retroflex stops. Malayalam (Table 7.2) contrasts three coronal gestures—dental, alveolar, and retroflex. In addition, Malayalam has bilabial, palatal, and velar sounds, so that it contrasts nasals with six basic types of gesture, six places of articulation, all of which are exemplified in Table 7.2. Because a retroflex gesture is made with the undersurface of the tip of the tongue touching or

near the back of the alveolar ridge, the blade (the upper surface of the tip) of the tongue is usually a considerable distance from the roof of the mouth. As a result, the tongue is somewhat hollowed, as shown in the diagram of a retroflex fricative [ʂ] in Figure 7.2. Try making this sound yourself. Start with [s], in which the tip of the tongue is raised toward the front part of the alveolar ridge. Now, while maintaining the fricative noise, slowly slide the tip of the tongue back, curling it up as you move it backward. You will be producing a consonant [ʂ], which sounds something like [ʃ], although the articulatory position is different. (See (6) below for discussion of the articulatory position of [ʃ].) When you have learned to say [ʂ], try adding voice so that you produce [ʐ]. Alternate the voiced and voiceless sounds [ʂʂʂʐʐʐʂʂʐʐʐ]. Next, still with the tip of the tongue curled up and back in this position, make the stops [ɖa, ɖa]. Notice how the stops affect the quality of the following vowel, giving it a sort of r-coloring at the beginning. Now produce the corresponding nasal [ɖ̃]. Learn to say all these sounds before and after different vowels. Finally, try to say the Malayalam words in Table 7.2. You may notice as you imitate these sounds that your tongue tip moves during the retroflex stops, sliding forward from post-alveolar toward a more alveolar place of articulation during the retroflex stop, so that the preceding vowel has more r-coloring than the following vowel.

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Figure 7.2 The articulation of the retroflex fricative [ʂ]. The dashed lines indicate the position of the sides of the tongue. This occurs in Malayalam too. Figure 7.3 (on the next page) shows a spectrogram of the Malayalam word [kØ=i] “link in chain,” in which we have traced with a white line the third vowel “formant”—the third highest acoustic resonance of the vocal tract. The third formant is known to go down in frequency for retroflex sounds. Notice in Figure 7.3 that the third formant drops to a low value at the offset of the vowel [Ø] preceding [=] and then at the end of [=] picks up at a somewhat higher value at the start of the following vowel [i]. This acoustic

dynamic is a reflection of the articulatory dynamics of the tongue tip sliding forward along the roof of the mouth during [==]. Retroflex stops and nasals occur in many of the major languages of India, and retroflex fricatives are not at all uncommon. They vary somewhat in the degree to which the tip of the tongue is curled backward. In Hindi and other languages of northern India, retroflex sounds often have the tip of the tongue only slightly behind the most prominent part of the alveolar ridge, much as indicated in Figure 7.2. In Malayalam and other languages spoken in the southern India, the tip is curled farther back, so that the underside of the tip of the tongue touches the roof of the mouth. (6) The palato-alveolar gestures for [S, Z] differ from retroflex gestures in the part of the tongue involved. The IPA chart uses the term “post-alveolar” for these sounds. We prefer the somewhat more specific term palato-alveolar. A palato alveolar gesture is one in which the target on the upper surface of the mouth is about the same as for a retroflex sound—at the margin between the alveolar ridge and the front of the palate. But unlike retroflexes, in this gesture, the front of

171 Chapter 7 CCCCCCCCCC CCCCCCCC Figure 7.3 A spectrogram of the Malayalam word [kØ==i] link in chain. The frequency of the third formant is traced with a white line. the tongue is slightly domed, as opposed to being hollowed. Compare Figure 1.11, which shows the position of the vocal organs in the palato-alveolar fricative [S] as in shy, with the retroflex fricative in Figure 7.2. Note that in both [β] and [S], the maximum constriction of the vocal tract occurs near the back of the alveolar ridge. But these two sounds are said to have different places of articulation, because the terms specify different gestures. The place of articulation designates both the target on the roof of the mouth and the part of the tongue moving toward that target. In retroflex sounds, it is the movement of the underside of the tip of the tongue that forms the gesture, but in palato-alveolar sounds, the active articulator is the tongue blade. EXAMPLE 7.4 Another way of distinguishing between retroflex and palato-alveolar sounds is to call them all post-

alveolar and, in addition, name the part of the tongue involved. Sounds made with the tip of the tongue may be called apical, and those made with the blade may be called laminal. Thus, the term retroflex is exactly equivalent to apical post-alveolar, and palato-alveolar is equivalent to laminal post-alveolar. There are advantages in introducing the terms apical and laminal in that they may also apply to other gestures. Dental sounds may be made with the tip of the tongue, or with the blade of the tongue, and so may alveolar sounds. With the use of these extra terms, we can distinguish between the apical dental stops that occur in Hindi (Table 6.7) and the laminal dental stops that occur in French.

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In Australian aboriginal languages, the difference between apical and laminal sounds is often very important. If you want to pursue this further, go to the map index under “extras” at the website, and check out the aboriginal languages spoken in Australia. In English, the only post-alveolar sounds are the palato-alveolar fricatives and affricates [S, Z, tS, dZ]. In other languages, such as French and Italian, there are nasals made in either the same or a very similar position. These nasals are often, arbitrarily, considered to be palatal sounds. No language that we know of makes a distinction between a palato-alveolar nasal and a palatal nasal. Some of the palatal sounds in Italian will be discussed later in this chapter. The IPA chart puts palato-alveolars into the post-alveolar column. A section labeled “other symbols” also mentions alveolo-palatals and provides the symbols [Ç, ,]. These symbols are used for voiceless and voiced fricatives in Polish and Chinese. Though similar to [S, Z], they have considerable raising of the front of the tongue. They are also made in the post-alveolar region. Tables illustrating contrasting fricatives in Polish and Chinese are at the website. Both these languages are interesting because they have dental or alveolar, post-alveolar (retroflex), and alveolo-palatal fricatives. We have discussed three kinds of post-alveolar sounds. These are all sounds in which the major constriction lies somewhere between the alveolar ridge and the dome of the palate.

As we mentioned, we prefer to use the terms palato-alveolar, alveolo-palatal, and retroflex because they convey more information than the more generic term post-alveolar. For instance, a palato-alveolar sound is basically alveolar (in tongue-body shape) with a post-alveolar constriction location, while an alveolo-palatal is basically a palatal sound (with a tongue-body shape more like the vowel [i]) but also with a post-alveolar constriction location. It should be noted though that these sounds are produced with a good deal of individual variation, as small differences in the shape of the roof of the mouth can have a big impact on the acoustic output. So, ultimately what is important from a speaker's point of view is to produce a noise that is accepted as the intended sound, and for some speakers this means that their alveolo-palatal may look quite a lot like another person's palato-alveolar. This highlights the importance of the ear training and production training exercises in each chapter of this book. (Note: There are some disagreements among authorities as to the best descriptions of these sounds.)

(7) Palatal sounds can be defined as being made with the front of the tongue approaching or touching the hard palate, and for many speakers, with the tip of the tongue down behind the lower front teeth. There is no clear-cut distinction between these sounds and palato-alveolar sounds. The only true palatal in English is /j/, which is usually an approximant but may be allophonically a voiceless fricative in words such as hue. The symbol for a voiceless palatal fricative is [ç], so this word may be transcribed phonemically as /hju/ and phonetically as [huç]. Voiceless palatal fricatives occur in German in words such as ich [ɪç], meaning 'I,' and nicht [nɪçt], 'not.'

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EXAMPLE 7.6 Say [ç] as in hue and then try to prolong this sound. Add voice so that you make a fricative something like the [j] as in you, but with the front of the tongue nearer the hard palate. The symbol [j̥], a curly-tailed j, is used for a voiced palatal fricative. Say [CCCj̥j̥CCCj̥j̥], making sure that the tip of the tongue is

down behind the lower front teeth. Now change the fricative [ʃ] into a stop by raising the front of the tongue still more, while keeping the tip of the tongue down. The symbols for voiceless and voiced palatal stops are [tʃ, dʒ]. Say sequences such as [tʃa] and [dʒa], making sure that the front of your tongue touches the hard palate but that the tip of the tongue is down. Then try making similar sequences with a palatal nasal (for which the symbol is [ɲ], reminding one of [n] and [j] combined). Palatal nasals occur in several languages, including French, Spanish, Italian, and many non-Indo-European languages. Try saying French words such as agneau [aɲo] ‘lamb’ and Spanish words such as Señor [seɲor] ‘Mr.’ Examples of Italian palatal nasals (and laterals) are at the website. Palatal stops are slightly less common than palatal nasals. They occur, for example, in Hungarian (you can search for them in the language index at the website), and they are part of the set of Sindhi stops discussed in the previous chapter and exemplified in Table 6.2 and at the website. Because of the shape of the roof of the mouth, the contact between the front of the tongue and the hard palate often extends over a fairly large area. As a result, the formation and release of a palatal stop is often not as rapid as in the case of other stops, and they tend to become affricates. (8) Velar stops and nasals [k, g, ŋ] occur in English. But unlike other languages such as German, we no longer have velar fricatives. They are not, however, hard to make. Starting from a syllable such as [ak], build up pressure behind the velar closure, and then lower the tongue slightly. The result will be a voiceless velar fricative, which we write as [x]. The symbol for the corresponding voiced sound is [ɣ]. As with other fricatives, learn to say [xxxVVVxxx]. Then produce sequences such as [axa, exe, oVo, EVE]. Examples of words in other languages containing velar fricatives are Lakhota, as shown in Table 6.1; German Achtung [/axtʰʌŋ] ‘warning’; Bach [bax] ‘Bach’ (proper name); and Spanish jamás [xaˈmas] ‘never’ ojo [ˈoxo] ‘eye’ pago [ˈpaVo] ‘I pay’ and diga [ˈdiVa] ‘speak.’ The Spanish [ɣ] is often not very fricative, and may be more

accurately transcribed using the symbol for a voiced velar approximant, which is [Ŷ]. The part of the tongue involved in making velar sounds, the back of the tongue, is called the dorsum; these sounds are referred to as dorsal sounds. (9) Uvular sounds are made by raising the back of the tongue toward the uvula. In a broader grouping of sounds, they, like velar sounds, can be called dorsal. They do not occur at all in most forms of English. But in French, a voiced uvular fricative—[ʁ]—is the common form of r in words such as rouge [ʁuʒ] ‘red’ and rose [ʁoz] ‘rose,’ more like an approximant. The voiceless uvular fricative, [χ], also occurs in French as an allophone of / ʁ / after voiceless stops, aCCAACCCCCCA tCCACCC

Table 7.3 Contrasts involving stops in Quechua. Palato-alveolar Velar Uvular tSaka kujuj qaŷu ‘bCAdAC’ tSÓaka ‘CCCAC CCC’ tS'aka ‘hCCCCC’ ‘CC mCvC’ kÓujuj ‘CC whACCCCC’ k'ujuj ‘CC CwACC’ ‘CCCACC’ qÓaŷu ‘ChCwC’ q'aŷu ‘CCmCCC CCCAC’ as in lettre [lEtX] ‘letter.’ French differs from English in that it often has per severative assimilations in which, for example, the voicelessness of one sound continues on through the following sound. Uvular stops, written [q, G], and nasals, written [–], occur as idiosyncratic pronunciations in English and as part of the regular sound systems of Eskimo, Aleut, and other Native American languages. Table 7.3 illustrates contrasts between uvular and velar stops and palato-alveolar affricates in Quechua, a Native American language widely spoken in Bolivia, Chile, and Peru. Note that Quechua has voiceless unaspirated plosives, aspirated plosives, and ejectives. One way of learning to produce uvular sounds is to start from a voice less velar fricative [x]. While making this sound, slide your tongue slightly farther back in your mouth so that it is close to the uvula. The result will be the voiceless uvular fricative [χ]. Learn to make this sound before and after vowels, in sequences such as [aXa, oXo, uXu]. You will find it easier to use back vowels at first; then go on to sequences such as [eXe, iXi]. Next, add voice to this sound, saying [XXX% % %XXX% % %]. Practice saying [ʁ] before and after

vowels. Try saying the French words cited in the first paragraph of this section, (9). Once you have mastered the pronunciation of uvular fricatives, try changing them into uvular stops. Say [aXa], then make a stop at the same place of articulation, saying [aqa]. Now produce a voiced uvular stop [aGa] and a uvular nasal [a-a]. Practice all these sounds before and after different vowels. (10)(11) The gestures for pharyngeal and epiglottal sounds involve pulling the root of the tongue or the epiglottis back toward the back wall of the pharynx. Many people cannot make a stop gesture at this position. Furthermore, it would be literally impossible to make a pharyngeal or epiglottal nasal. Closure that deep in the vocal tract would prevent the airstream from coming through the nose. But pharyngeal fricatives, shown by the symbols [ʕ, ʁ], can be made, and they do in fact occur in Semitic languages such as Arabic and Hebrew. The Arabic word for ‘bath’ is [ʕammaam], for ‘uncle’ [ʔamm]. The articulation varies considerably in the Semitic languages, some speakers using epiglottal and others pharyngeal gestures. These sounds also vary considerably with regard to

EXAMPLE 7.7 EXAMPLE 7.8 112 Chapter 7

CCCCCCCCCCCC CCCCCCCC the degree of constriction. For many speakers, there is little or no actual friction, so that approximants rather than fricatives are produced. The voiced fricative made in this region usually has a great deal of laryngealization (creaky voice), perhaps because the necessary constriction in the pharynx also causes a constriction in the larynx. Neither Hebrew, Arabic, nor any of the other Semitic languages distinguish between pharyngeal and epiglottal fricatives; but some of the languages of the Caucasus contrast these two possibilities. The website has a recording of Agul, which contrasts voiceless pharyngeal [ʕ] and epiglottal [ʁ] fricatives. Non-native speakers of Agul find it difficult to distinguish pharyngeal and epiglottal sounds, but it is worth practicing the contrast as you listen to the Agul examples. If you try to constrict your pharynx as much as possible, you will probably be doing so by retracting the epiglottis. Try to produce the voiceless sound [ʕ].

Now, if you can, produce this sound before a vowel. Next, try to make the voiced sound [ʔ], not worrying if it turns out to have creaky voice. Produce these sounds in the Arabic words cited above. Before finishing this section on gestures at different places of articulation, we must note that some sounds involve the simultaneous use of two gestures. The English approximant [w] has both an approximation of the lips (making it a bilabial sound) and of the back of the tongue and the soft palate (making it a velar sound). Sounds that involve these two gestures are called labial velars, or, in some more old-fashioned books, labiovelars. EXAMPLE Extras Yoruba, Ewe, Tiv, and many other languages spoken in West Africa have labial velar stops. Some of the languages spoken in this area also have labial velar nasals. As in the case of nasal and voiced clicks, we can symbolize two co-occurring articulations with a tie bar joining two symbols. The Yoruba for ‘arm’ is [ak^opa!] and for ‘adult’ is [a~g^oba~]. In these words, the two closures occur almost simultaneously. Of course you can say the sequence [akpa] and naturally get some overlap of the two stop consonant gestures, but one of the best ways of learning to say the two consonant gestures simultaneously is to start by making a bilabial click (a kissing sound, but with the lips being simply compressed and not puckered) between vowels. Say [a] ‘kiss’ [a] at first slowly, and then as fast as you can. Then weaken the suction component of the kiss, so that you are making little more than a labial velar articulation between vowels. The result should be a labial velar stop much as in the Yoruba word [ak^opa!], ‘arm.’ (More information about Yoruba labial velars can be found at the website by using the language index.) This is a convenient place to review all the places of articulation we have discussed so far. Table 7.4 is a consonant chart showing the symbols for all the nasals, stops, and fricatives that have been mentioned, except for the epiglottal consonants. Check that you know the values of all these symbols. Remember that you can hear Peter Ladefoged’s pronunciation of them at the website by clicking on the IPA chart.