Feature representations

In the text, we defined the phonological features used to represent sounds and illustrated the feature specifications of some of the consonants and vowels of English. Unlike in the case of constructing syllables, there is no straightforward algorithm for setting up feature representations. It is possible, however, to simplify the task of determining feature representations for individual sounds by going through the process in a step-wise fashion, asking oneself certain key questions in a particular order.

I. What is the manner of articulation of the sound?
To determine the answer to this question, use the major class features and the manner features.
  1. Start by asking yourself if the sound is [+sonorant] or [-sonorant].
  2. Is it [-consonantal] or [+consonantal]?
  3. Is it [+syllabic] or [-syllabic]?
  4. Is it [+continuant] or [-continuant]?
  5. Is it [-nasal] or [+nasal]?
  6. If [+sonorant, +consonantal, -nasal], is it [-lateral] or [+lateral]?
  7. If [-sonorant, +consonantal, -continuant], is it [+DR] or [-DR] ([±delayed release])?

Once the major class divisions have been determined, the next step is to go on to the laryngeal features.

II. What is the laryngeal setting of the sound?
To determine the answer to this question, use the laryngeal features.
  1. Is it [+voice] or [-voice]?
  2. Is it [+CG] or [-CG] ([± constricted glottis])? This question is only relevant to [ʔ].
  3. Is it [+SG] or [-SG] ([±spread glottis])? In English, this question is only relevant to [h] and aspirated sounds.

Finally, place of articulation must be determined.

III. What is the place of articulation of the sound?
To determine the answer to this question, use the place of articulation features.
  1. Which articulator is active in producing the sound?
  2. If [LABIAL], is the sound [+round] or [-round]?
  3. If [CORONAL], is the sound [+anterior] or [-anterior]
4. If [DORSAL], is the sound [+strident] or [-strident]?
   [+high] or [-high]
   [+low] or [-low]
   [+back] or [-back]

   These questions are only for vowels.+
   [+] or [-tense]
   [+reduced] or [-reduced]?

To illustrate what complete feature representations look like, Figure 1

gives feature matrices for [t, m, and i]. In the matrices, features are listed
following the same basic order as the one we have just followed to arrive at the
feature representations: the major class features are followed by the manner
features; the manner features are followed by laryngeal features; and, finally,
laryngeal features are followed by place of articulation features with the
articulator feature given first.

![Feature matrices for three English sounds](image)

In the feature matrices in Figure 1, a complete set of features is given for
every phoneme. However, it is not always necessary to give a complete set
of features for a sound, and so in some cases predictable features are left out. The
reason for this is that in some situations certain features are inherently
predictable and so can be left out of feature representations. For example, as we
saw above, segments that are [+high] are always [-low] because the two tongue positions represented by these features are mutually exclusive. Conversely, segments that are [+low] are always [-high]. When giving feature representations for [+high] segments, therefore, it is not absolutely necessary to include the feature [-low], since this feature is predictable; similarly for [+low] segments it is not necessary to include the feature [-high] in the representation, since [-high] is predictable. The phoneme /l/ is another example: this segment in English is the only [+lateral] sound in the language; to represent it, therefore, it is sufficient to represent it simply as [+lateral]. All its other features are predictable. Other examples of features that are predictable in English include [+voice] on sonorant consonants and vowels and [-nasal] on vowels. Since sonorant consonant and vowel phonemes are always [+voice] (unless they become devoiced by a phonological process such as liquid-glide devoicing), [+voice] can be left out of the feature representations for these phonemes. Similarly, since vowel phonemes in English are never contrastively nasal, they are always [-nasal]; therefore, [-nasal] does not have to be part of the representation of vowel phonemes.

You are now ready to do the exercises on feature representations.