

Phonology

Phonology is essentially the description of the systems and patterns of speech sounds in a language. It is, in effect, based on a theory of what every speaker of a language unconsciously knows about the sound patterns of that language. Because of this theoretical status, phonology is concerned with the abstract or mental aspect of the sounds in language rather than with the actual physical articulation of speech sounds.

Phonology is about the underlying design, the blueprint of each sound type, which serves as the constant basis of all the variations in different physical articulations of that sound type in different contexts. When we think of the [t] sound in the words tar, star, writer and eighth as being “the same,” we actually mean that, in the phonology of English, they would be represented in the same way. In actual speech, these [t] sounds are all very different.

However, all these articulation differences in [t] sounds are less important to us than the distinction between the [t] sounds in general and the [k] sounds, or the [f] sounds, or the [b] sounds, because there are meaningful consequences related to the use of one rather

than the others. These sounds must be distinct meaningful sounds because they are what make the words tar, car, far and bar meaningfully distinct.

Phonemes

Each one of these meaning-distinguishing sounds in a language is described as a phoneme. When we learn to use alphabetic writing, we are actually using the concept of the phoneme as the single stable sound type which is represented by a single written symbol. It is in this sense that the phoneme /t/ is described as a sound type, of which all the different spoken versions of [t] are tokens. Note that slash marks are conventionally used to indicate a phoneme, /t/, an abstract segment, as opposed to the square brackets, as in [t], used for each phonetic or physically produced segment.

An essential property of a phoneme is that it *functions contrastively*. We know there are two phonemes /f/ and /v/ in English because they are the only basis of the contrast in meaning between the words fat and vat, or fine and vine. This contrastive property is the basic operational test for determining the phonemes that exist in a language. If we substitute one sound for another in a word and there is a change of meaning, then the two sounds represent different phonemes.

Each phoneme has its own “features” that distinguish each phoneme from the next. They are called ‘distinctive features’ If the feature is present, we mark it with a plus sign (+) and if it’s not present, we use a minus sign (-). Thus /p/ can be characterized as [-voice, +bilabial, +stop] and /k/ as [-voice, +velar, +stop]. Because these two sounds share some features (i.e. both are voiceless stops), they are sometimes described as *members of a natural class of sounds*.

Phones and allophones

While the phoneme is the abstract unit or sound-type (“in the mind”), there are many different versions of that sound-type regularly produced in actual speech (“in the mouth”). We can describe those different versions as phones. Phones are phonetic units and appear in square brackets. When we have a set of phones, all

of which are versions of one phoneme, we add the prefix “allo-” (= one of a closely related set) and refer to them as allophones of that phoneme.

For example, the [t] sound in the word *tar* is normally pronounced with a stronger puff of air than is present in the [t] sound in the word *star*. If you put the back of your hand in front of your mouth as you say *tar*, then *star*, you should be able to feel some physical evidence of aspiration (the puff of air) accompanying the [t] sound at the beginning of *tar* (but not in *star*). This aspirated version is represented more precisely as [t^h]. That’s one phone. The [t] sound between vowels in a word like *writer* often becomes a flap, which we can represent as [D]. That’s another phone. In the pronunciation of a word like *eighth* (/etθ/), the influence of the final dental [θ] sound causes a dental articulation of the [t] sound. This can be represented more precisely as [t̪]. That’s yet another phone. There are even more variations of this sound which, like [t^h], [D] and [t̪], can be represented in a more precise way in a detailed, or narrow, phonetic transcription. Because these variations are all part of one set of phones, they are referred to as **allophones** of the phoneme /t/.

The crucial distinction between phonemes and allophones is that substituting one phoneme for another will result in a word with a different meaning (as well as a different pronunciation), but substituting allophones only results in a different (and perhaps unusual) pronunciation of the same word.

Minimal pairs and sets

Phonemic distinctions in a language can be tested via pairs and sets of words. When two words such as *pat* and *bat* are identical in form except for a contrast in one phoneme, occurring in the same position, the two words are described as a minimal pair. More accurately, they would be classified as a minimal pair in the phonology of English. (Arabic, for example, does not have this contrast between /p/ and /b/.) Other examples of English minimal pairs are *fan*–*van*, *bet*–*bat*, *site*–*side*.

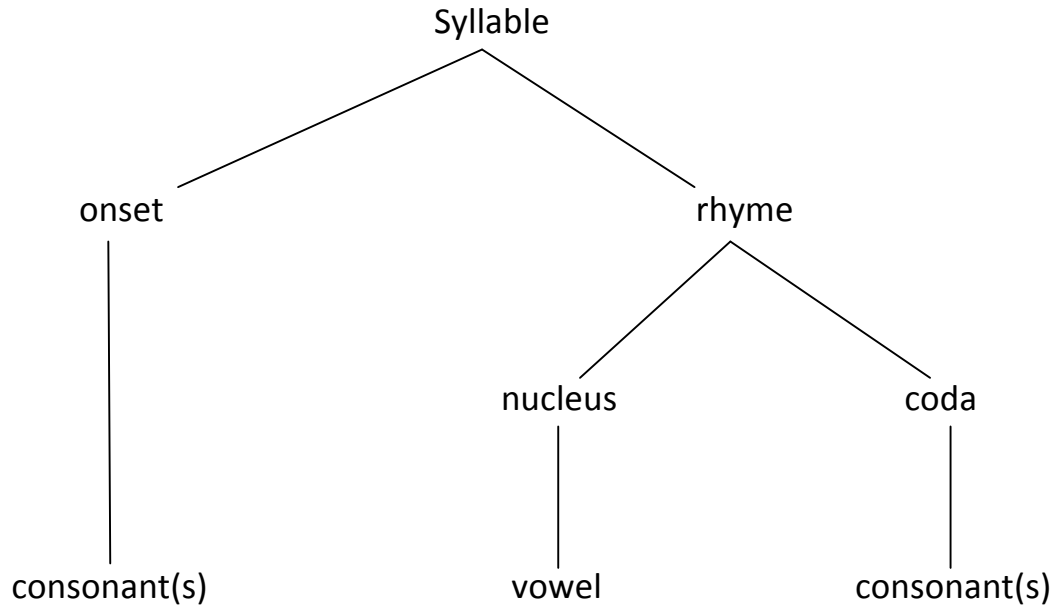
When a group of words can be differentiated, each one from the others, by changing one phoneme (always in the same position in the word), then we have a **minimal set**. For example, one minimal set based on the vowel phonemes of English could include feat, fit, fat, fate, fought, foot, and another minimal set based on consonant phonemes could have big, pig, rig, fig, dig, wig.

Phonotactics

There are definite patterns in the types of sound combinations permitted in a language. Obeying some constraints on the sequence or position of English phonemes. Such constraints are called the phonotactics (i.e. permitted arrangements of sounds) in a language and are obviously part of every speaker's phonological knowledge. In English, the minimal set we have just listed does not include forms such as lig or vig. According to the dictionary, these are not English words, but they could be viewed as possible English words. That is, our phonological knowledge of the pattern of sounds in English words would allow us to treat these forms as acceptable. It is, however, no accident that forms such as [fsɪg] or [rnɪg] do not exist or are unlikely ever to exist.

Syllables

A syllable must contain a vowel or vowel-like sound, including diphthongs. The most common type of syllable in language also has a consonant (C) before the vowel (V) and is typically represented as CV. Technically, the basic elements of the syllable are the onset (one or more consonants) followed by the rhyme. The rhyme (sometimes



written as “rime”) consists of a vowel, which is treated as the nucleus, plus any following consonant(s), described as the coda. Syllables like *me*, *to* or *no* have an onset and a nucleus, but no coda. They are known as *open syllables*. When a coda is present, as in the syllables *up*, *cup*, *at* or *hat*, they are called *closed syllables*. The basic structure of the kind of syllable found in English words like *green* (CCVC), *eggs* (VCC), and *am* (VC), *ham* (CVC), *I* (V), *do* (CV), *not* (CVC), *like* (CVC), *them* (CVC), *Sam* (CVC), *I* (V), *am* (VC).

Consonant clusters

Both the onset and the coda can consist of more than one consonant, also known as a consonant cluster. The combination /st/ is a consonant cluster (CC) used as onset in the word *stop*, and as coda in the word *post*. There are many CC onset combinations permitted in English phonotactics, as in *black*, *bread*, *trick*, *twin*, *flat* and *throw*.

Coarticulation effects

Mostly our talk is fast and spontaneous, and it requires our articulators to move from one sound to the next without stopping. The process of making one sound almost at the same time as the next sound is called coarticulation. There are two well-known coarticulation effects, described as assimilation and elision.

Assimilation

When two sound segments occur in sequence and some aspect of one segment is taken or “copied” by the other, the process is known as assimilation. If we think of the physical production of speech, we realize that this regular process happens simply because it’s quicker, easier and more efficient for our articulators as they do their job.

Elision

This process of not pronouncing a sound segment that might be present in the deliberately careful pronunciation of a word in isolation is described as elision. e.g. We may, for example, pronounce and as [ænd] by itself, but in the normal use of the phrase you and me, we usually say [ən], as in [juənmi]. This isn’t laziness, it’s efficiency. There is also typically no [d] sound included in the everyday pronunciation of a word like friendship [frɛnfɪp].