

TUTORIAL
5.7

Phonetics 5

This tutorial finishes the series on phonetics. We will be talking about some other factors affecting speech sounds, like tone and stress. We will also be doing some more transcription and review exercises.

Introduction

So far, we have looked at *consonants* and *vowels* and the symbols on the IPA chart that represent the particular sounds of Australian English. Now we are going to look at some other factors that affect speech sounds in particular ways, and how these secondary features are represented by marks that we add to the IPA symbols.

Some secondary features

Nasalization

Remember that the velum (soft palate) can be up or down. It is up against the back wall of the throat when making stops like [b] and down when making nasals like [m]. When it is up, air is prevented from going out the nasal passages and nose, and when it is down, air can escape through the nasal passages. During the making of the vowels that we discussed in the last tutorial, the velum is up, meaning that air can't get out through the nose, though it can escape through the mouth, since vowels don't involve any obstruction of the airflow.

It is possible to lower the velum when making a vowel, meaning that air could get out through both the mouth and the nose. A vowel that's made when the velum is lowered is referred to as a *nasalized* vowel.

When we want to say something extra about a sound, something that usually doesn't apply to it, we often add a little mark above or below the symbol. A mark like this is called a *diacritic*. The way we mark nasalization is by adding a diacritic, in this case a wavy line, called a *tilde*, over the symbol of the vowel involved.

For example [ũ] is a nasalized tense high back rounded vowel. Nasalization is *predictable* in English: a vowel that occurs before a nasal consonant in the same syllable is nasalized; other vowels are not nasalized. We say that nasalization is predictable in English because it *always and only* occurs before nasal consonants - so we can accurately predict when it will occur. For example - *beat* is [bit], but *bean* is [bĩn]. Say these two words and listen to the difference in how you say the vowel - in the second one, the velum is lowered and air is escaping through the mouth and nose.



In many other languages, nasalization is distinctive - it isn't predictable. For example, in French *beau* is [bo], but *bon* is [bõ] - the only difference is the nasalization of the vowel sound. Because nasalization is predictable in English we often don't mark it in broad transcriptions.

The voiceless diacritic

Some types of sound are usually voiced, including nasals, laterals, and vowels. But in some languages these sounds can also be voiceless. Japanese has voiceless vowels. To mark such a sound as voiceless, we place a diacritic in the form of a little circle under its symbol, so [u̥] is the symbol for a voiceless tense high back rounded vowel.

n Some other languages have voiceless nasals, and/or laterals, and/or rhotics. Burmese has voiceless nasals. We use the voiceless diacritic under the symbol for the particular sound - for example, [n̥] represents a voiceless alveolar nasal.

Aspiration

Another issue to do with voicing can apply to some consonants – specifically to *stop* consonants. What we find in some situations is that when a stop comes immediately before a sound that would normally be voiced, the voicing (vocal cord vibration) doesn't start immediately, but is delayed. During this delay, a puff of air comes out of the mouth. This delay in voicing is called *aspiration*. The symbol for aspiration is a small raised <h> after the symbol for the stop involved.

t^h For example in the word *tap*, we start with a [t], which is voiceless, but then there is a vowel, and vowels are usually voiced, but in this word the voicing doesn't start until a little time after the vowel begins. Say the word and you will hear the puff of air after the [t] sound. We say that the word *tap* begins with an *aspirated stop*, (specifically an aspirated voiceless alveolar stop), and we would write it as [t^h].

In English the only sounds that are aspirated are [p], [t], and [k], and they're only aspirated in one situation, when they're the first segment in a stressed syllable (we'll talk about segments and stress soon). For example, the [k] in *kind* is aspirated, so we would write the symbol for it as [k^h], but the [k] in *skin* is not, because it's not the first sound of the syllable, and the [p] of *stop* is not aspirated either. Because aspiration is predictable in English, we often don't mark it when doing a broad transcription.

Suprasegmental features

The properties that we've been talking about so far, like the places and manners of articulation, voicing, and aspiration in consonants, or frontness and roundedness in vowels, are all features of *individual sounds*.

You can say that a particular sound is bilabial or voiced or rounded. You would not usually say that a *syllable* was rounded. However, there are some features that aren't properties of individual sounds, but properties of whole syllables, or words, or even of phrases and sentences. These kinds of features are known as *suprasegmental features*.

We are going to talk more about syllables later, but you know basically what a syllable is – for example the word *marker* has two syllables, but the word *post* has one.

Stress

One of the suprasegmental features is *stress*. If you say any English word of two or more syllables to yourself, then you'll notice that one of the syllables stands out more than the others. For example, in the following words the syllable that stands out more than the others is marked with a thing like an apostrophe: *unin'tentional*, *abo'litionist*, *compo'sition*. The syllable after the mark is the one that stands out - this is the stressed syllable.

A *stressed* syllable is one on which more energy is expended; this often means that it's louder, sometimes it differs in pitch, and sometimes it's longer. Stress is an important feature of English because sometimes different words differ only in which syllable is stressed: compare for example the noun *'permit* (an official document of authorization) with the verb *per'mit* (to give authorization or consent to someone).

In English, which syllable is stressed is not easily predictable; but in some other languages it is usually predictable and regular. For example, in Turkish, stress is usually predictable and there's a simple rule for it: the last syllable of a word is usually the syllable with stress. In Standard Fijian it is also predictable - the second last syllable is usually stressed, unless the last syllable has a diphthong or a long vowel, in which case that syllable is stressed.

In the IPA stress is marked by a short raised vertical line, as in these words - *in'surance*, *'final*, *sent'i'mental*, *con'sent* - (here we have used English spelling, but generally we would be using this marker in a transcription with IPA symbols). It is possible to mark a couple of different levels of stress, but we will only worry about primary stress - marking the syllable of a word that the *most* energy is expended on.

Intonation

If you listen carefully you'll notice that the *pitch* of the voice is constantly going up and down in English sentences, and that sentences have a sort of melody. In English, and in all other languages, the pitch pattern of phrases and sentences is used to give certain kinds of information. For example, you can make a statement into a question simply by changing its pitch pattern: compare "He's here." to "He's here?" Or, "You're going today." to "You're going today?" Such pitch patterns and changes are referred to as *intonation*.

Tone

In many languages, like Chinese and Thai, pitch is also used in another way: words can have the same segments but differ in their pitches (not absolute pitches, as with music, but their pitch relative to one another) – this use of pitch is called *tone*. Tonal languages are extremely common in Africa and East Asia. Tones are used in different ways in different languages - sometimes the contour (shape) of the tone is important, sometimes the tone is the same for an entire word, or is different for each syllable. A language that is considered to be a *tonal language* is one that uses tone to convey meaning - for example, Mandarin Chinese has five distinct tones, so the same segment can have five different meanings depending on the tone used: mā "mum/mom", má "hemp", mǎ "horse", mà "scold", ma (a question marker).

The Syllable

We've been talking in terms of segments and we've discussed features, which segments are composed of, but of course there are larger units of speech, like words, phrases, and *syllables*. It has proven quite difficult to come up with a universally agreed upon definition of the syllable, but we all have some intuitive notion of the syllable, and we usually agree about how many syllables a word has (although it's sometimes more difficult to decide on the boundaries between syllables in a word).

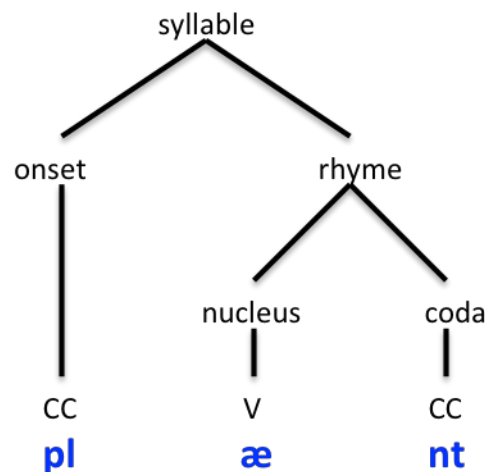
Many languages have a writing system that's based on the segments of the language, like the English alphabet. But some languages have *syllabic* writing systems, in which symbols generally stand not for segments, but for whole syllables. Inuktitut (spoken in northern Canada) has a syllabic writing system; the writing system of ancient Babylonian was also largely syllabic.

We use the Greek letter sigma, σ , to stand for a syllable.

Syllables have internal structure:

- The “core” of a syllable is called the *nucleus*; every syllable must have a nucleus, and it’s usually a vowel.
- Anything in the syllable after the nucleus is the *coda* - there will only be consonants in it.
- The nucleus and the coda together make up the *rhyme*.
- Anything in the syllable before the nucleus is the *onset*; only consonants will be found in the onset.
- A syllable can consist only of the nucleus (it doesn’t have to have an onset or coda).

For example the English word *plant* consists of a single syllable. In the diagram this syllable has been broken up into its onset (any consonants preceding the vowel) and its rhyme (all sounds from the vowel to the end of the syllable). The rhyme has been further divided into the nucleus, which in the vast majority of syllables is a vowel, and the coda, which are any consonants following the nucleus.



Phonotactics

Languages differ in which sounds they have, but they also differ in where in syllables sounds can occur, and what combinations can occur in different places in syllables. The rules that govern this are called *phonotactic* rules, and every language has them.

Languages differ a lot in their phonotactic rules. English is more free than some languages, though not as free as others. English allows syllables to begin with two consonants (to have two consonants in the onset), which not all languages permit - there are some languages like Hawaiian, in which you can only ever have one consonant in the onset.

Phonotactic rules not only say *how many* segments you can have in a particular place in the syllable, they also say *which* segments you can have there. Although English allows sequences of two consonants in the onset, it doesn't permit just any combination of consonants there; in fact it's quite restrictive. For example, the sequences [kn] and [pn] are not allowed to occur syllable-initially (remember we are not talking about spelling, but sequences of phonetic sounds).

English also allows three consonants in onsets, but not just *any* combination of three consonants; in fact, the first one will always have to be [s], the second one must be a voiceless stop, and the third one must be a liquid or a glide (e.g. strike, splayed). This is a phonotactic rule of English. English doesn't allow onsets with more than three consonants, but there are languages that do.

There are also restrictions about what can appear in the codas of syllables. For example in English a syllable can end in the sequence [pt], as in the word *apt*, but they cannot end in the sequence [tp]. Also, there are interesting rules about where certain sounds can occur. The velar nasal, [ŋ], is not a rare sound in English, we find it in words like *sing* and *ring*, but it is never at the beginning of a syllable in English. In other languages, such as Ata (PNG) it is quite common to have [ŋ] at the onset of syllables, such as in most of the syllables in the sentence for "you (pl) go and sleep" - *ngingi ngalai ngai*.

Because these rules exist, we can talk about *possible* words of English or another language - words that don't exist but could - as they don't violate the phonotactic rules of the language.

For example, there's no such word as *blit* in English, but there could be (maybe the name of a new product), while the word *bnit* is not a possible word of English, because it breaks the rules.

There are some universal phonotactic rules as well - there are sequences of sounds in particular places in syllables that no language allows. One example of this is the sequence [lp] which is rarely or never found in syllable onsets.



ACTIVITIES

Phonetics 5

1. Write stress markers in the correct places for the following words according to the definition given (answers on the next page):
 - object - a thing, article, item or device (noun)
 - object - to lodge a protest against (verb)
 - subject - topic, issue, question or concern (noun)
 - subject - put through, treat with or expose to (verb)
 - digest - absorb, take in, understand or comprehend (verb)
 - digest - compilation, synopsis or summary (noun)
2. Look at the following English words that have been adapted to fit Japanese phonotactic rules. From looking at the way the words have been adapted, try to work out the phonotactic rules of Japanese (answers on following page).

English	Japanese
<i>Let's [speak] English!</i>	<i>Retsu ingurishu!</i>
<i>France</i>	<i>Furansu</i>
<i>Privacy</i>	<i>puraibashii</i>
<i>Smith</i>	<i>Sumisu</i>
<i>Table</i>	<i>teburu</i>

3. Try to write out the following phonetic transcription using English spelling - (the : mark indicates a lengthened vowel - it won't affect your spelling, but when you say the word, lengthen the vowel before this symbol. This transcription also uses a 'barred u' rather than the conventional [u] and an [e] for the [ɛ] sound). The answer is on the next page, but try to do it on your own before looking.

di:p dæʊn hiə bæ ðə dɜ:k wɔ:tə lɪvd æʊld ɡɔləm ə smo:l slæmi:
 kri:tʃə æ dəʊnt nə we: hi: kæɪm frɔm no: hʌ: o: wɔt i: wɔz hi: wɔz ə
 ɡɔləm əz dɜ:k əz dɜ:kʊəs əksept fə tʌ: biɡ ɹæʊnd pæɪl æz ɪn hi:z θɪn
 fæɪs hi: hæd ə lɪtl bəʊt ən i: ɹæʊd əbæʊt kwæɪt kwæɪtli: ʊn ðə læɪk fo:
 læɪk ɪt wɔz wæd ən di:p ən dedli: kæʊld hi: pæɪld ɪt wɪð lɜ:dʒ fi:t
 dæŋɡlɪŋ æʊvə ðə sæd bət neʊvə ɪ ə ɹɪpəl dɪd i: mæɪk nɔt hi: hi: wɔz
 lʊkɪŋ æʊt əv hi:z pæɪl læmplæk æz fə blænd fiʃ wɪtʃ hi: ɡræbd wɪð ɪz
 lɔŋ fɪŋɡəz əz kwɪk əz θɪŋkɪŋ hi: lækt mi:t tʌ: ɡɔblən hi: θo:t ɡud wen i:
 kəd get ət bət hi: tʊk ke: ðæɪ neʊvə fæʊnd hɪm æʊt hi: dʒəs θɪɔtld əm
 frɔm bi:hænd ɪf evə ðæɪ kæɪm dæʊn əlæʊn eni:we: nɪə ði: edʒ əv ðə

wɔ:tə wael hi: wəz pɪæçliŋ əbæət ðæi seldəm dɪd fə ðæi hæd ə
 fi:lɪŋ ðət səmpθɪŋ ɪnplezənt wəz lɜ:kɪŋ dæən ðe: dæən ət ðə ve:ri: ɹæ:ts
 əv ðə məʊntən

Activity Answers:

1. Stress markers:

'object - a thing, article, item or device (noun)

ob'ject - to lodge a protest against (verb)

'subject - topic, issue, question or concern (noun)

sub'ject - put through, treat with or expose to (verb)

di'gest - absorb, take in, understand or comprehend (verb)

'digest - compilation, *synopsis or summary* (noun)

2. Japanese phonotactic rules:

Japanese syllables must be consonant-vowel, so words borrowed from English are adapted to fit this rule. Any consonant clusters have been split and final consonants have had a vowel added.

3. Transcription exercise:

Deep down here by the dark water lived old Gollum, a small slimy creature. I don't know where he came from, nor who or what he was. He was as dark as a Gollum as dark as darkness, except for two big round pale eyes in his thin face. He had a little boat, and he rowed about quite quietly on the lake; for lake it was, wide and deep and deadly cold. He paddled it with large feet dangling over the side, but never a ripple did he make. Not he. He was looking out of his pale lamp-like eyes for blind fish, which he grabbed with his long fingers as quick as thinking. He liked meat too. Goblin he thought good, when he could get it; but he took care they never found him out. He just throttled them from behind, if ever they came down alone anywhere near the edge of the water, while he was prowling about. They seldom did, for they had a feeling that something unpleasant was lurking down there, down at the very roots of the mountain.