

Concepts from phonology (like phonemes, allophones, etc.) have proven very useful for describing patterns that occur in second language learning, and predicting what sounds may be challenging for what kinds of learners. Here let's examine two prominent models of second language phonological development: the Speech Learning Model and the Perceptual Assimilation Model.

Speech Learning Model

The Speech Learning Model, developed by Jim Flege, is a pretty big deal, and you can find a lot of detailed information about it at http://jimflege.com/discussion_Topic1.html, including a very informative set of slides. Here I will just give a brief and simplified explanation of it.

The basic idea of this model is that all sounds of a new language (L2) fall into one of three categories, based on how they relate to sounds of your first language (L1):

- **Same:** The sound in your L2 is the same as a sound in your L1
- **New:** The sound in your L2 is a new sound, which does not exist in your L1
- **Similar:** The sound in your L2 is similar, but not the same, as a sound in your L1.

Remember the issues that we discussed in the previous activities: whether a language "has" a sound or "does not have" a sound is a pretty complicated issue. And a given phoneme can be pronounced in many different ways.

"Same" sounds are easy to learn, because they match a sound that already exists in your language. Think about your first language (for most of you this is probably Cantonese or Mandarin), and think about another language you learned (English or some other language). Can you think of a sound from your L2 that is the "same" as a sound in your L1?

"New" sounds are a bit harder to learn. For example, as an English speaker, I had a hard time learning [y] (the vowel in Mandarin words like 去), because this sound does not belong to any English phonemes in my dialect of English. Thinking about your L1 and any L2 you have learned, can you think of any examples of "new" sounds?

"Similar" sounds are the hardest to learn properly. These are sounds that fall into the same category as an existing sound in your language, but they're actually pronounced a little bit differently. For example, English and Mandarin both have aspirated stops: consider, for instance, the consonant at the beginning of *top* and the consonant at the beginning of 土. The Mandarin stops, however, are *more* aspirated; Mandarin aspirated stops tend to have a longer "puff of air" (aspiration) compared to English stops. To take another example, consider the [u] vowel in English and Mandarin. In English, we pronounce this vowel with our tongue raised a bit further

towards the front of the mouth; for an exaggerated example, listen to how the guy pronounces *dude* in [this video making fun of stereotypical California accents](#), after his hair changes color. On the other hand, in Mandarin, the [u] vowel is pronounced with the tongue raised further towards the back of the mouth. This means that, for example, English *who* and Mandarin 胡 don't have quite the same vowel; we would call both of them [u], but they are slightly different. These are extremely difficult for language learners to pronounce properly, because language learners tend to assume that they are "same" sounds, and will keep pronouncing them the way they are pronounced in their first language, instead of recognizing that they are slightly different. The reason they're so challenging is because they're slightly different sounds but they are both versions of the same phoneme in the person's first language.

Can you think of any examples of "similar" sounds that have caused you problems when you learned a second language?

Perceptual Assimilation Model

The Perceptual Assimilation Model, developed by Cathy Best, is based on a very similar set of concepts and similar logic as the Speech Learning Model. The Introduction section of the below paper has a very good description of it; in this document I will offer a short and simplified summary.

- Reid, A., Burnham, D., Kasisopa, B., Reilly, R., Attina, V., Xu Rattanasone, N., & Best, C. (2015). [Perceptual assimilation of lexical tone: The roles of language experience and visual information.](#) *Attention, Perception, & Psychophysics*, 77, 571-591.

The Perceptual Assimilation Model is all about how we map second language sounds onto the sound categories (i.e., phonemes) in our first language. Keep in mind that all sounds of our first language fit into categories: that's the fundamental idea of phonology.

Unlike the Speech Learning Model, the Perceptual Assimilation Model focuses mainly on *contrasts* between two sounds. Thus, rather than focusing on which individual sounds a learner will have trouble pronouncing or perceiving, it focuses on which *pairs* of sounds will be difficult for a learner to hear (or pronounce) the difference between. For example, as an English speaker learning Mandarin, when I first started learning I had trouble distinguishing between 去 and 出, but of course I had no trouble distinguishing between 去 and something totally unrelated like 黄. So, to analyze sounds using the Perceptual Assimilation Model, keep in mind that we will be thinking of *distinctions between two different sounds*, rather than thinking about individual sounds alone.

When you hear a sound of your second language, you try to fit it into a category in your first language. For example, the vowel in Mandarin 米 sounds like the vowel in English "me"; I'll assume that those both go in the category /i/. The consonant in Cantonese 時

sounds like the consonant in English "sea", so I'll assume that these both go in the category /s/. And so on and so forth.

Now imagine what happens when you hear two sounds from a language, and have to try to assign them to categories in your native language. There are several possible situations that can happen:

- **Two different categories:** The two L2 sounds fit into two different L1 sounds. (For example, if I hear Mandarin 咖 and 媽, the consonant in 咖 maps onto the English /k/ category, and the consonant in 媽 maps onto the English /m/ category.) It is very easy to hear or pronounce the difference between these two.
- **Same category:** The two sounds, which are "different" (i.e., coming from different phonemes) in the L2, both fit into the same category in the L1. (For example, the Mandarin sounds written in Pinyin as *x* and *sh*—from, e.g., 虛 and 書—both sound like [ʃ] to many English speakers.) It is very difficult to hear or pronounce the difference between these.
- **One sound uncategorized, one sound categorized:** Sometimes one of the L2 sounds fits into a category of the L1, and the other one doesn't. i.e., one of the sounds is so weird and foreign that it doesn't sound anything like any sound that exists in the L1. For example, the vowel in Cantonese 時 is pretty much exactly the same as the English /i/ vowel (from words like *sea*), but the vowel in a Cantonese syllable like 區 (written in Jyutping as *keoi*) is not very similar to any English vowel.

It is pretty easy for learners to hear and pronounce the difference between these, since it's clear that one vowel is familiar and one vowel is totally weird.

- **Both sounds uncategorized:** Another possibility is that neither sound fits into an L1 category. For example, the Cantonese vowels in 區 (*keoi*) and 梁 (written in Jyutping as *leong*, but you're probably more familiar with it written as *Leung* in people's surnames) are both pretty foreign for English speakers, and neither one fits well into any English vowel category. For a pair of sounds like this, how hard or easy it will be depends on how phonetically similar they are, since the L1 phonological system neither helps nor hurts the learner.
- **Difference in category goodness:** Sometimes both sounds fit in the same category, but one sounds like a "good", "canonical" pronunciation that fits perfectly into the category, and the other one sounds a bit worse. In other words, maybe the Mandarin sound represented by Pinyin *sh* sounds like a very good match for English "sh", whereas the Mandarin sound represented by Pinyin *x* sounds sort of like English "sh" but sounds like a slightly weird way of pronouncing it. In this case, whether it's easy or difficult to hear the difference between the sounds will depend on how well they fit into the category.

The useful thing about the Phonological Assimilation Model is that it can make very specific predictions about what pairs of sounds will be difficult for learners.

Let's think about the tones of Mandarin and Cantonese. If you're like me (a Mandarin speaker who has only learned a little bit of Cantonese), you've probably noticed that some Cantonese tones sound very similar to Mandarin tones, and some don't. This is exactly the kind of situation where the Phonological Assimilation Model can apply. Look at the below tables: one looks at the Mandarin tones and thinks about how a Cantonese speaker will learn them, and one looks at Cantonese tones and thinks about how a Mandarin speaker will learn them.

First, for each individual tone, think of what it sounds like (e.g., for each Mandarin tone, think of which Cantonese tone it sounds like [if any]; or, for each Cantonese tone, think of which Mandarin tone it sounds like [if any]). Then, using the situations described above, fill in the table to see which contrasts will fit which situations (e.g., which will be "two different categories", which will be "same category", etc.).

Mandarin tones

Tone 1 (55): sounds like...

Tone 2 (35): sounds like...

Tone 3 (213): sounds like...

Tone 4 (51): sounds like...

Mandarin tone contrasts – which will be difficult for Cantonese speakers?

	Tone 1	Tone 2	Tone 3	Tone 4
Tone 1				
Tone 2				
Tone 3				
Tone 4				

Cantonese tones

Tone 1 (55): sounds like...

Tone 2 (35): sounds like...

Tone 3 (33): sounds like...

Tone 4 (21): sounds like...

Tone 5 (13): sounds like...

Tone 6 (22): sounds like...

Cantonese tone contrasts – which will be difficult for Mandarin speakers?

	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5	Tone 6
Tone 1						
Tone 2						
Tone 3						
Tone 4						
Tone 5						
Tone 6						