

Spanish spirantization

[b] is a voiced labial stop; [d] is a voiced alveolar stop (some Spanish speakers pronounce this as dental instead of alveolar); [g] is a voiced velar stop

[β] is a voiced labial fricative; [ð] is a voiced dental (similar to alveolar) fricative; [ɣ] is a voiced velar fricative

Here is a list of some Spanish words:

[tia]	<i>aunt</i>
[beso]	<i>kiss</i>
[deðo]	<i>finger</i>
[peso]	<i>peso (unit of money)</i>
[dia]	<i>day</i>
[usteð]	<i>you</i>
[donde]	<i>where</i>
[gato]	<i>cat</i>
[teta]	<i>breast</i>

A) Can you prove that any two consonants (e.g., [b] and [d], [ð] and [d], etc.) are definitely different sounds in this language's phonological system? How can you prove that?

/t/ and /d/, because they make a minimal pair ([dia] and [tia])

B) Describe the relationship(s) between the sounds [d], [t], and [ð]. Are any of them different phonemes? Are any of them allophones of the same phoneme?

[ð] seems to be an allophone of /d/ that is realized when /d/ occurs between two vowels (whereas this same phoneme is realized as [d] elsewhere). [t] seems to be an allophone of its own different phoneme, /t/ (we can see from words like [gato] and [teta] that [t] can occur between vowels, whereas we never see [d] between vowels).

Here is another list of Spanish words:

[dama]	<i>lady</i>	[una ðama]	<i>a lady</i>
[bota]	<i>boot</i>	[una βota]	<i>a boot</i>
[dota]	<i>dotes on</i>	[la ðota]	<i>dotes on her¹</i>
[gota]	<i>drop</i>	[una γota]	<i>a drop</i>
[gasa]	<i>gauze</i>	[la γasa]	<i>the gauze²</i>

E) It should be clear from this list of words that one sound can change into another sound when it is put in a certain context. Based on this list of words, write a "rule" or "formula" describing how [ð] can be derived from [d]. You don't need to know any technical/formal notations; you just need to somehow describe what context causes [d] to change, and what [d] changes into when in this context. (If you want to use formal/technical notations, that is also ok, but it is not necessary.)

There are three ways we could express this:

$d \rightarrow \theta / V_V$

$VdV \rightarrow V\theta V$

"d is realized as θ when it occurs between two vowels"

F) Can you generalize this rule to [b] and [β], and [g] and [γ]?

$[\text{voiced stop}] \rightarrow [\text{fricative}] / V_V$

$V [\text{voiced stop}] V \rightarrow V [\text{fricative}] V$

"Voiced stops are realized as fricatives when they occur between two vowels"

¹ "la" means "her", and is the object of the verb. Spanish sometimes has Subject-Object-Verb constructions like this, where the object can come before the verb. (Specifically, this happens when the object is a *clitic*.) These are details you don't need to know for our class.

² This "la" is different than the "la" we saw before. This "la" means "the".

Here is another list of Spanish words:

[kasa]	<i>house</i>	[una kasa]	<i>a house</i>
[tia]	<i>aunt</i>	[una tia]	<i>an aunt</i>
[palmera]	<i>palm tree</i>	[una palmera]	<i>a palm tree</i>

G) Do these words pose a challenge to the rule(s) you wrote in questions (E) and (F)? If so, write a new version of the rule(s) here, such that it can handle these words as well.

If I had not said "voiced" in the previous rule (e.g., if I had said $V[\text{stop}]V \rightarrow V[\text{fricative}]V$) then there would have been a problem, because a rule like that would have incorrectly predicted that e.g. the /t/ in "una tia" would change into a fricative. What we see from these new rules is that voiceless stops don't change. That's why the rule mentioned previously needs to specify that it only operates on voiced stops.