

Phonemes, allophones, and complementary distribution
I. Follow-up from Assignment #1

- (1) What can we conclude about the pronunciation of the hiragana character <ん>?
- (2) This illustrates several important concepts:
 - (a) Sounds often behave in **systematic** ways according to their **phonetic properties**
 - **natural class** — a group of sounds with phonetic properties in common that behave in a consistent fashion
 - (b) The pronunciation of a single mental sound category can **vary according to context**

II. Mental sound categories: Phonemes

- (3) The following two sounds both occur in the phonetic forms of English and Spanish words
 - (a) [d] — voiced alveolar stop (strictly speaking, it is dental rather than alveolar in Spanish)
 - (b) [ð] — voiced dental fricative
- (4) English examples

(a)	[<u>d</u> ɛn] <i>den</i>	[low <u>d</u>] <i>load</i>	
(b)	[<u>ð</u> ɛn] <i>then</i>	[low <u>ð</u>] <i>loathe</i>	
- (5) Spanish examples

(a)	[<u>d</u> uða] ‘doubt’	[<u>d</u> oβlar] ‘to double’	
	[kon <u>d</u> uðas] ‘with doubts’	[sin <u>d</u> oβlar] ‘without doubling’	
(b)	[la <u>ð</u> uða] ‘the doubt’	[re <u>ð</u> oβlar] ‘to redouble, to reiterate’	
	[mi <u>ð</u> uða] ‘my doubt’	[o <u>ð</u> oβlar] ‘or to double’	
- (6) Crucial point: The status of these two sounds is different in English and in Spanish
 - (a) In English: Two words may differ only in whether one has [d] and one has [ð], and this is enough for the words to contrast in meaning
 We say that [d] and [ð] in English:
 - are **contrastive**, or are in **contrastive distribution**
 - belong to **separate phonemes** (/d/ and /ð/)
 - (b) In Spanish: The “same sound” appears as [d] or as [ð] depending on its phonological environment; replacing [d] with [ð] does not change meaning
 We say that [d] and [ð] in Spanish:
 - are in **complementary distribution**
 - are **allophones** of the same phoneme (which we might call /d/)

(7) Some basic definitions:

phoneme — mental sound category

allophone — the surface realization(s) of a phoneme

(8) Every phoneme has at least one allophone; some have more than one

	English		Spanish		
phoneme(s)	/d/	/ð/	/d/		<i>(posited in mental representations)</i>
			^		
allophone(s)	[d]	[ð]	[d]	[ð]	<i>(observed in language data)</i>

(9) We can make the case that two sounds are allophones of the same phoneme even if we lack direct evidence of them turning into each other when the context changes (as seen in the Spanish example above)

—> Demonstrate that the sounds are in **complementary distribution**

(a) Determine the environments where each sound occurs

(b) If those environments are distinct (non-overlapping), then the sounds are in complementary distribution

(c) Phonetically similar sounds in complementary distribution can be argued to belong to the same phoneme

(10) How to carry out an analysis of phonological distribution

(a) Demonstrate contrastive or complementary distribution (determine environments)

(b) If there are multiple allophones of one single phoneme:

- “Name” the phoneme (we usually choose the default/general allophone for this)
- State the conditions under which the default form changes into each of the other allophones — always do this in terms of **phonetic properties** when describing the environment and the changes that are made to produce the appropriate allophone
- (Linguists: Feel free to apply features, rules, constraints, etc.)

(11) A note on phonemes vs. spelling

(a) Many spelling systems operate at approximately the level of the phoneme

- Often, each phoneme is spelled differently but multiple allophones of the same phoneme are spelled the same way (Spanish [duða] ‘doubt’ is spelled duda)

(b) However, this is not guaranteed — remember Japanese <と う>/<to> = [to:]

(c) Best practice: Spelling may serve as a supplementary source of evidence if relevant, but **consider phonological evidence first**

(12) Examples from Japanese:

(a) Going back to the question of the phoneme category spelled as <ん>: How should we analyze this sound?

(b) Can we determine the distribution of the **voiceless vowels** [j], [ɯ]? What is their status with respect to the phoneme inventory of Japanese?