

**Week 2 Class 2: contour segments, free variation,
contextually limited contrast, foreign accent transfer**

Readings: Hayes (APS reader) Chapter 3

Homework: Homework 2 due before lecture April 19th;

Term Paper: Requirements handed out in class today and available on the web.

I. What we have learned about phonemicization so far:

- **Minimal pairs/near minimal pairs:** if you find a minimal pair, the sounds are contrastive, different phonemes
- **Complementary distribution:** if sounds never occur in the same environment, they are in complementary distribution, therefore allophones of one phoneme
- Problems so far
 - i. English /h/ and /ŋ/ are in complementary distribution, but phonemes not allophones
 - ii. English [p] and [k^h] are in complementary distribution, but [k^h] is not an allophone of [p]
- Further criteria for phonemicization:
 - i. native speaker intuition: are they the same sound, different sounds?
 - ii. phonetic similarity: allophones are usually be phonetically similar (remember this is relative and hard to measure; may also be obscured by historical change)

II. Other Problems in Phonemicization

I. Borrowed sounds:

- In Standard Japanese (native words only) [ɸ] (voiceless bilabial fricative) and [h] were in complementary distribution
 - i. [ɸ] only occurred before [u] and [h] occurred elsewhere
- Japanese borrowed /f/ initial words from English and other foreign languages.
 - i. [ɸ] used as best Japanese approximation of foreign /f/

before /a/		before /e/		before /o/	
[ɸaito]	‘fight’	[ɸesutibar <u>u</u>]	‘festival’	[ʃiɸoŋ]	chiffon
[ɸaŋ]	‘fan’	[ɸeruto]	‘felt’	[ɸo:ku]	fork
 before /i/					
[ɸirumu]	‘film’				

- Result: if you take into account the foreign words, [ɸ] and [h] are no longer in complementary distribution.
- The analysis depends of native speaker intuition:
 - i. Are [ɸ] and [h] one sound or the same sound?
 - ii. Do speakers consider the borrowed words to be “real” Japanese?
 - iii. There may be two types of speakers:
 1. conservative/older speakers: consider these words exotic, like English speakers consider *fois gras*: [fwa] – no other [fw] in English
 2. innovative/young speakers: consider them normal, everyday words.
- Lexical stratification may be answer for the phonological analysis
 1. Native Japanese Stratum: [ɸ] and [h] are allophones of the same phoneme
 2. Borrowed word Stratum: allows for exceptions, without affecting the phonological representation of the Native Stratum words

2. *Free variation: when you can say the same thing two different ways*

- **First Type: Phonological doublets** – the same person might use two variants: *envelope* [énvəloʊp] or [ánvəloʊp]
 - one listing in the lexicon (one mental dictionary entry) with two different phonemic forms –
- **Second Type: Optional rules:** English word final stops: Glottalization is an optional rule in English: I usually apply this rule, but not when speaking emphatically.

$\left[\begin{array}{l} +\text{stop} \\ -\text{voice} \end{array} \right] \rightarrow [+constricted\ glottis] / \text{ ____ }_{\text{word}}$

- In this case /sɪt/ does not have two phonemic forms in the lexicon; there is one underlying form /sɪt/; glottalization may or may not apply.
- **Not all rules are optional:** Dentalization is not optional, it is obligatory: /tɛnθ/ → [tɛnθ̪]

3. *Modern Greek: Free variation may not be so free*

- Modern Greek has two forms of the following words

[+fricative][+fricative]	[+fricative][+stop]	
[fθinós]	[ftinós]	‘cheap’
[xθés]	[xtés]	‘yesterday’
[áximos]	[áskimos]	‘disgusting’
[písθike]	[pístike]	‘was persuaded’
[+stop][+stop]	[+fricative][+stop]	
[eptá]	[eftá]	‘seven’
[ktíma]	[xtíma]	‘farm’
[péktis]	[péxtis]	‘player’

- Two possible optional rules?
 - fricative → stop / [+fricative] _____ : /fθinós/ → [ftinós]
 - stop → fricative / _____ [+stop]: /eptá/ → [eftá]
- Lexical stratification may again be the answer for the phonological analysis, not optional rules
- Modern Greece has two varieties (Diglossia): Katharevousa = “pure greek” (*katharós* ‘clean’), Demotic Greek: people’s Greek. *Katharevousa* archaized forms of modern words, purged of “non-Greek” vocabulary
 - Katharevousa stratum: [+fricative][+fricative] and [+stop][+stop] sequences are ok
 - Demotic Stratum: these sequences don’t exist
 - Same word essentially has two representations, which belong to two different strata, two different phonologies; used in different social contexts, writing vs. speaking, levels of formality.
- ❖ **Moral to the story:** you may need some “extra” information, such as the external history of the language (Japanese – which words were borrowed from who, how the Greek dictatorship tried to “clean up” the language), sociolinguistic variation.

4. *Contour segments vs. sequences*

- Contour segments: sounds with two phonetic qualities treated in phonology as a single segment
 - diphthongs: [aɪ] in English
 - affricates: [tʃ] English, Spanish, Italian
 - prenasalized stops: [m̠b], [n̠d]: Calabrian (Extreme Southern Italian) *ndrangheta* [n̠drángeta] ‘organized crime family’, [m̠bivíri] ‘to drink’

- iv. Greek speakers have intuition that the following sounds are single segments (one letter): ψ [ps], ξ [ks]
- Polish [tʃ] vs. [tʃ̥]
 - i. The two different spellings help, native speakers have intuition that they are different:
 - ii. [tʃ̥i] *czy* ‘if, whether’
 - iii. [tʃi] *trzy* ‘three’
 - iv. [tʃ̥] is phonetically shorter than [tʃ];
 - v.

5. *What are affricates? Contour segments or sequences in English?*

	Favoring cluster/sequence interpretation	Favoring Unit/contour segment interpretation
1.	Two phonetic components: [tʃ] e.g. stop [t]+ fricative [ʃ]	Other “units” are phonetically complex [tʰ] = [t] + [h]
2.	Other consonants can occur in a consonant cluster, but affricates cannot. e.g.: [pr], [tr], *[tʃr]	There are other cluster restrictions on single consonants e.g. *[sr], *[tl]

6. *Affricates in Italian: contour segments or sequences /tʃ/, /dʒ/, /ts/, /dz/*

Some possible other phonological diagnostics for Italian

- **Distinctive length:** Italian allows a length distinction for most single segments
 - i. e.g. /sét:e/ ‘seven’ vs. /séte/ ‘thirst’
 - ii. No length distinction for clusters like /st/, /sk/: e.g. */pas:ta/ vs. /pasta/
- **Morphology: definite article “the”**
 - i. /il/ precedes single segments (and CL- maybe also single), *il sapone, il treno, il gatto*
 - ii. /lo/ precedes SC sequences: *lo strumento, lo studente*
- **Morphology: verb conjugation** – stems that end in two consonants are conjugated in a different way than stems that end in one consonant (syllabification doesn’t matter). One consonant stems have an –isk- infix.

<i>dormire</i> ‘to sleep’		<i>aprire</i> ‘to open’		<i>capire</i> ‘to understand’		<i>finire</i> ‘to finish’	
<i>sing.</i>	<i>plur.</i>	<i>sing.</i>	<i>plur.</i>	<i>sing.</i>	<i>plur.</i>	<i>sing.</i>	<i>plur.</i>
<i>dormo</i>	<i>dormiamo</i>	<i>apro</i>	<i>apriamo</i>	<i>capisco</i>	<i>capiamo</i>	<i>finisco</i>	<i>finiamo</i>
<i>dormi</i>	<i>dormite</i>	<i>apri</i>	<i>aprite</i>	<i>capisci</i>	<i>capite</i>	<i>finisci</i>	<i>finite</i>
<i>dorme</i>	<i>dormono</i>	<i>apre</i>	<i>aprono</i>	<i>capisce</i>	<i>capiscono</i>	<i>finisce</i>	<i>finiscono</i>

- **Spelling**
 - i. One symbol for contour segments
 - ii. Two symbols for sequences
- **Native speaker intuition:** One sound or a sequence of sounds?
- **Split-ability/Experimental approach:** ask speakers to say a series of words in two parts to see if they split the cluster/segment

	/tʃ/ and /dʒ/		/ts/ and /dz/	
	Cluster	Single segment	Cluster	Single segment
Distinctive length		<i>bacio</i> /batʃo/ ‘kiss’ vs. <i>faccio</i> ‘I do’ /fatʃ:o/	No possible length distinction. (true of other consonants also)	
Morphology		<i>il cioccolato</i> /il tʃok:olatino/ <i>il gelato</i> /il dʒeláto/	<i>lo zucchero</i> /lo dzuú:k:ero/ (/ts/ never occurs word-initially)	
		<i>inferocire</i> ‘to become ferocious’ /inferotʃi:re/ <i>inferocisco</i> <i>reagire</i> /readʒi:re/ <i>reagisco</i>		<i>imbizzare</i> ‘to get mad’ /imbitsi:re/ <i>imbizzisco</i>
Spelling	/tʃ/ and /dʒ/ are written with two letters: <i>ce, ci: ciao</i> /tʃáw/ <i>ge, gi: giorgio</i> /dʒórdʒo/		Sometimes written with ‘zz’, no difference in realization <i>specializzazione</i> /spetʃalitsatsi:óne/	/ts/ and /dz/ are written with one letter “z” /informatsi:óne/ <i>informazione</i> , “z” /dzuúkkero/ <i>zucchero</i>
Speaker Intuition		one sound		one sound
Split?	vat ʃo	va tʃo vatʃ o	vat so	va tso vats o

❖ Requires detailed phonological analysis and consideration of many factors – I still haven’t decided.

7. Contextually-Limited contrast: Some phonemic contrasts are limited to a particular environment

- Toba Batak (Austronesian) – Has voiced vs. voiceless consonants contrast

Toba Batak – word initial stops			
Voiceless		Voiced	
a. [pinoppar]	‘descendent’	d. [biaŋ]	‘dog’
b. [tuak]	‘palm of wine’	e. [dukkar]	‘let out’
c. [korea]	‘korea’	f. [garut]	‘name of town in Indonesia’

- Only voiceless consonants occur word finally

Toba Batak – word final stops	
Voiceless	
a. [sukkup]	‘adequate’
b. [surat]	‘letter’
c. [rappok]	‘steal’

- Rule: [+stop] → [-voice] / ____]_{word}
 - This can be tested noting the treatment of words borrowed into the language:
 - Can be tested by historical (if there is any written record) or comparative data: e

- Constraint: * $\left[\begin{array}{l} +\text{stop} \\ +\text{voice} \end{array} \right] / ____]_{\text{word}}$
 - i. “Voiced stops are banned in word final position”

8. *Calabrian/Sicilian (Extreme Southern Italian) – Data from dialect of Tropea*

Tropean Vowels								
1.	[tʃiráza]	‘cherry’	2.	[frĩsku]	‘cold’	3.	[ntsúɲa]	‘lard’
4.	[fĩku]	‘fig’	5.	[padéa]	‘frying pan’	6.	[néspulu]	‘loquat’
7.	[gat:ó]	‘potato pie’	8.	[páni]	‘bread’	9.	[óvu]	‘egg’
10.	[gót:u]	‘container’	11.	[nét:u]	‘clean’	12.	[pĩʃi]	‘fish’
13.	[póju]	‘chicken’	14.	[pĩru]	‘pear’	15.	[pilári]	‘to burn’
16.	[sáli]	‘salt’	17.	[piséa]	‘peas’	18.	[sárva]	‘sage’
19.	[spétsi]	‘black pepper’	20.	[sédʒa]	‘chair’	21.	[sánu]	‘whole’
22.	[kurúja]	‘round bread’	23.	[limúni]	‘lemon’	24.	[lórdu]	‘dirty’
25.	[lávuru]	‘laurel’	26.	[kurtéu]	‘knife’	27.	[kátu]	‘bucket’

- **What are the vowels in Calabrian? Where do they occur? What is the rule/constraint?**
- Evidence for rule/constraint: Words borrowed from English (or Italian) undergo the rule: *Marlboro* /marbóru/
- **Neutralization:** Notice, this rule is not turning a phoneme into an allophone that never occurs elsewhere. The result of the rule is also a phoneme. In stressless syllables, phonemic distinctions between mid vowels are neutralized.

9. *Why restrict vowel contrasts to stressed syllables? – Similar rules in English, Brazilian Portuguese, Standard Italian*

- Stressed syllables are longer and louder in this language: Unstressed vowels are shorter, not as loud: harder to hear mid-vowel contrast
- However, this rule/constraint is not an automatic physical effect

10. *Contextually limited contrast: More Tropean data – Where do /r/ and /l/ contrast?*

Tropean /l/ vs. /r/								
1.	[ab:uf:ársi]	‘stuff with food’	2.	[aspáritʃi]	‘asparagus’	3.	[virdúra]	‘vegetables’
4.	[alívu]	‘olive’	5.	[aráɲgu]	‘orange’	6.	[sartsa]	‘sauce’
7.	[ariganéu]	‘oregano’	8.	[brúnu]	‘plum’	9.	[vrók:a]	‘fork’
10.	[sórdi]	‘money’	11.	[káрни]	‘mean’	12.	[lórdu]	‘dirty’
13.	[lavandĩnu]	‘sink’	14.	[limúni]	‘lemon’	15.	[rit:u]	‘said’

11. *Rules vs. constraints in general*

- Rule:
 - i. you may need forms that are borrowed from another language to show that it exists
 1. e.g Italian /soldi/ realized as [sordi] in Tropean
 - ii. Rule tells you how to fix the problem

/l/ → [r] / ___ C
- Constraint:
 - i. distributional provides negative evidence (it doesn’t exist therefore it must be banned)
 1. There are no /l/’s before consonants in Tropean
 - ii. Doesn’t tell you how to fix the problem.
 1. How does a Tropean speaker realize Italian /soldi/ in Tropean?
 2. What happens to English *Marlboro*?

12. *Foreign Accents and Transfer*

- Phonological theory claims that phonological rules/constraints are internalized
- Evidence comes from second language acquisition
 - i. A foreign accent is not simply missing the mark
- Three main sources of foreign accent
 - i. Speakers apply internalized rules of native language to a foreign language (that doesn't have that rule)
 - ii. Speakers fail to detect and apply a phonological rule of the foreign language
 - iii. Speakers don't distinguish the phonemes of the foreign language

13. *Application of native language rule to a foreign language*

- English speakers apply aspiration when speaking Spanish and Italian
 - i. Spanish [tu] realized as [t^hu]

14. *Speakers fail to detect and apply phonological rule*

- Spanish speakers of English don't apply Aspiration rule:
- Spanish speakers of English don't apply Velarization: word final /t/ is velar

15. *Failure to detect phonemic difference*

- Italian has double/long consonants:
 - i. /set:e/ 'seven' vs. /sete/ 'thirst'
- Vowels are also short before long consonants, long before short consonants
 - i. [set:e] 'seven' vs. [sete] 'thirst'
- English has two phonemes /b/ and /v/: 'bile' 'substance secreted by liver' vs. 'vile' 'loathsome'
- Peninsular Spanish doesn't distinguish between /b/ and /v/ - they only have /b/ with the allophone [β]
 - i. /v/ is illegal in peninsular Spanish

16. *Illegal distribution of allophones*

- Allophonic distribution of /j/ and [dʒ] in Peninsular Spanish
 - i. Word/phrase initial [dʒ]: *llueve* [dʒweβe] 'it rains'
 - ii. intervocalic [j]: *esta lloviendo* [está joβiénd] 'it is raining'
- Phonemic difference in English
 - i. /j/ 'you', /dʒ/ 'June'
- Spanish has both sounds; theoretically they should be able to get "you" and "June" because they exist in Spanish.
 - i. Depending on distribution in sentence either realized as initial [j] or [dʒ] (following Spanish distribution)

17. *Illegal phonemes or sequences:*

- Phonology is the set of legal sequences in a language (hlep cannot be English)
- Phonology specifies the things that are pronounceable
- Word initial /s/ + another consonant never occurs in Spanish
 - i. *estudiante* 'student', *escribir* 'write'
 - ii. no words like 'spaghetti' or 'Spain'
 - iii. How are these sequences realized in Spanish accented English?