

Class 3, 10/8/20: Marginal Phonemes II; The Level System

1. Assignments

- Readings:
 - Liberman and Prince (1977), up to page 309.
 - Posted on the course website
- Please hand in Homework #1 (Ambisyllabicity).

2. Other

- Please email me if you need access to the 251A course web site, I can add you.

3. Where are we in the course? Covered so far

- The History of English, and the synchronic patterns we have today that have diachronic explanations.
- Ambisyllabicity: allophones and phonotactics, marching in lockstep
 - Seeking a reason for the lockstep
 - The Fivefold Way of English phonological environments

4. For today

- A few more comments on ambisyllabicity
- Marginal phonemes
- The justification for morphological levels.

AMBISYLLABICITY: A BIT MORE

5. Theories

- I'm skipping two (Selkirkian coda theory; Kiparskian feet) because they only address a subset of the data — I think Gussenhoven's critique is pretty compelling.
- What we have in contention are two approaches:
 - Classical ambisyllabicity theory (Kahn, improved by Gussenhoven)
 - Something from phonetics — still vague.

6. What might help in phonetics

- "Ambisyllabicity" is just an extreme form of two intersecting tendencies.
 - Onset fortition, particularly for pretonic onsets

- Intervocalic weakening

7. Pretonic fortition

- I don't know the typology but it is intuitive.
- We know from the books by Matthew Gordon and Kevin Ryan on weight¹ that
 - Low-sonority onsets (like obstruents) are mildly stress-attracting (e.g. in Pirahã).
 - There are strong symmetries in STRESS-TO-X, X-TO-STRESS constraints, which might carry over.

8. Some approaches to intervocalic lenition

- Effort conservation (Kirchner 2000;² LAZY constraint family.
- Assist parsing by phrasal sonority continuity (Jonah Katz).³
- See Cohen-Priva and Gleason in recent *Language*,⁴ using Judea Pearl's theory of causality.⁵ They think it's just a response to shortening.

9. A puzzle on all accounts

- Why are the ambisyllabicity effects stronger posttonically than post-atonically?
 - e.g. Tapping in *pity* vs. *vanity*; /nt/ Tapping in *center* vs. *carpenter*

10. Another puzzle: Why us?

- What might it be about the phonetics of English (and perhaps also Dutch and German) that marshals the whole allophonic system to behave this way?
- I.e. are there abstract principles of phonetic implementation that might take over the role of ambisyllabicity in the phonetic description?

BACK TO CRUMMY PHONEMES OF ENGLISH

11. Defining a crummy phoneme

- One where minimal or near-minimal pairs exist, but are highly limited (in number and/or distribution).

¹ Matthew Gordon: *Syllable Weight: Phonetics, Phonology, Typology*, 2006, Routledge. Kevin M. Ryan (2019). *Prosodic weight: categories and continua*. Oxford: Oxford University Press.

² *An Effort Based Approach to Consonant Lenition*. Robert Kirchner. Psychology Press, 2001

³ Katz, J., & Fricke, M. (2018). Auditory disruption improves word segmentation: A functional basis for lenition phenomena. *Glossa: A Journal of General Linguistics*, 3(1), 38.

⁴ The causal structure of lenition: A case for the causal precedence of durational shortening. Uriel Cohen Priva, E Gleason *Language* 96

⁵ See his audacious work *The Book of Why* for a popularizing introduction.

12. Amplifying the taxonomy: Where do crummy phonemes come from?

- Last time:
 - Opaque phonology or sound change
 - Sound changes arrested in midcourse
 - Foreign influence: the allophone is promoted to phoneme (Ito/Mester) DONE
- I forgot to include:
 - boundary-effect contrasts
- Covered already: foreign influence: [ã], [x], Bruce's [a] ~ [ɑ] distinction.⁶

BOUNDARY-EFFECT CRUMMY PHONEMES

13. Definition

- These occur when the same “deep” phonemes are treated differently by the phonology in different grammatical contexts.

14. Ancient history

- The American Structuralists loved this German pair⁷

[tauxən] = [taux + ən] ‘dive-infinitive’
 [tauçən] = [tau + çən] ‘rope-diminutive’

The normal analysis is underlying /ç/, with

ç → x / [+back] ____

blocked by the productive boundary preceding the diminutive suffix.

UR /ç/ is motivated by [ç] after consonants (*durch* [duɤç]) and in rare initial position (*China* [ˈçina])

- How to block? Perhaps prosodic domains, perhaps Lexical Phonology ...

15. An English example of a junctural phoneme: [iə]

Ely ‘proper name’ [ˈili]
eel-y ‘covered with eels’ [ˈiəti]

⁶ Teaching it didn't help; I remain, alas, the only English speaker known to me who has this.

⁷ Leopold, Werner F., "German ch." in Martin Joos, *Readings in Linguistics*. New York: American Council of Learned Societies. 1958. Moulton, William G., "Juncture in Modern Standard German," in same volume pp. 208-214.

<i>keeling</i>	‘keel (over)-progressive’	[^h kiəlɪŋ]
<i>keyling</i>	‘little key’	[^h kiɪɪŋ]
<i>Ealing</i>	‘district of London’	[^h iɪɪŋ]

- The data given are oversimplified.
 - *keeling* seems not too bad as [^hkiɪɪŋ].
 - *Ealing* seems not bad as [^hiəɪɪŋ].
 - The difference given is really a preference.
- Most of the data can be explained as follows.
 - The [i]-[iə] distinction (or /l/-darkness?) is inherited in paradigms.

bases: *eel* [^hiəɪ], *keel* [^hkiəɪ], *key* [^hki]

- Inheritance is strong in forms derived productively (*eel-y*, *key-ling*), less so in words that may have their own lexical listing (*keeling*).

16. A paper that discusses this

- B. Hayes (2000) "Gradient well-formedness in Optimality Theory". In Joost Dekkers, Frank van der Leeuw and Jeroen van de Weijer, eds., *Optimality Theory: Phonology, Syntax, and Acquisition*, Oxford University Press, pp. 88-120. On my web site.
- Experimental method is bad; others have improved it ...

17. Example 2; /ɑ/ before /rd/, /rt/

- Source: Leonard Bloomfield (1933) *Language*, 366
- He describes for some GenAm speakers:

<i>cart</i>	[^h kɑːɪt]
<i>carter</i>	[^h kɑːɪtə]
<i>Carter</i>	[^h kɑːɪtə]
<i>hard</i>	[^h hɑːɪd]
<i>harden</i>	[^h hɑːɪdən]
<i>garden</i>	[^h gɑːɪdən]

“The word *larder* (not part of the colloquial vocabulary) could be read with the shorter variant, but the agent-noun *larder* (‘one who lards’) could be formed only with the longer type.”

- See Alice Turk's work for more cases of this kind, with experimental support.⁸

18. We have a theory of this now

- Braver, Aaron. "Modelling incomplete neutralisation with weighted phonetic constraints." *Phonology* 36, no. 1 (2019): 1-36.
- He produces a MaxEnt phonetic grammar, with output-to-output correspondence constraints.

19. Are these effects enormous in scope, or do they cover just particular sounds?

- I have no idea.
- See below on hard vs. soft allophones.

CRUMMY PHONEMES DERIVING FROM OPAQUE PHONOLOGY

20. North American English /aɪ/ vs. /ʌɪ/

- Perhaps the most famous of phonological chestnuts, made famous by Chomsky and Halle in the early 1960's.
- The idea is that an allophonic rule of Raising is counterbled by neutralizing Tapping

<i>write</i>	<i>writer</i>	<i>ride</i>	<i>rider</i>	
/ ^h ʌɪt/	/ ^h ʌɪt-ə/	/ ^h ʌɪd/	/ ^h ʌɪd-ə/	underlying form
ʌɪ	ʌɪ	—	—	Raising
—	r	—	r	Tapping
[^h ʌɪt]	[^h ʌɪrə]	[^h ʌɪd]	[^h ʌɪrə]	surface form

- Raising exists elsewhere; e.g. I say [^hʌɪrə] for both, but can optionally say [^hʌɪt] for *write* (and not *[^hʌɪd] for *ride*).⁹
- Claimed surface distribution: [ʌɪ] may occur before voiceless consonants and before [r] in phonological alternation with [t]; [aɪ] elsewhere.
- This presupposes that [r] derived from /t/ *even in monomorphemes* (like *colitis*) are detectable as such during acquisition (through slow speech?).

21. The dialectology is quite complex

- ... as is shown in the Vance readings.

⁸ With Sugahara. Durational correlates of English sublexical constituent structure. 2009 *Phonology* 26:477 - 524

⁹ In truth I think height for me in /aɪ/ is fully gradient. In *writer* and *rider* (homophonous), both have an intermediate value.

22. Vance weighs in with three native speakers

- All with long residence (but not exclusively) in Rochester, New York: himself, his Mom, his high school chum — varying in their degree of connection with Roch)
- This is an early paper but he diligently used pre-digital corpus search, to move beyond the anecdotal.
- Bottom line: there are cases of both [aɪ] and [ʌɪ] that are in the “wrong” location by the classical analysis.

23. Travel probably makes a difference

- The old friend speaks purest Rochester.
- Vance and Mom to Maryland during his ages 12-14.
- He picked up [ɛʊ] for *o:, so clearly was influenced.
- “Wrong” [aɪ] cases sometimes occur in learned words, perhaps heard from a non-Raising speaker.

bison [aɪ] (Vance, Mom)

colitis [aɪ] (Vance)

stipend [aɪ] (Vance, Mom)

but *like* [aɪ] (Vance); perhaps an adolescent import from the discourse particle *like*?¹⁰

24. Psychological status

- Native perception is crystal-clear; a hallmark of phonemicity
- No trouble eliciting despite no help from orthography.
- Compare Bruce’s frustrating efforts to elicit such data! — classic case non-native speaker lacking a good perceptual boundary.
- Also Kie Zuraw’s childhood memory: “Hey, why are these words spelled the same??”

25. Morphological inheritance

- There are some indications that, like Type I crummy phonemes, the [ʌɪ]/[aɪ] distinction gets inherited morphologically, presumably through Correspondence.

anti-Semitic [aɪ], after *anti*

¹⁰ See discussion of stressed *can* below.

- ... and further that such inheritance is more likely in morphologically transparent examples:

high chair [ʌɪ]

high school [ʌɪ]

- ... and that, counter to classical Lexical Phonology, it is the transparency of the individual word, rather than of its affix, that is essential

bifocals [aɪ]

bicycle [ʌɪ]

26. Extension of [ʌɪ]: Vowel reduction? Effect of word frequency

- Extension of [ʌɪ] to *tiger* and to many /r/ words like *fire* — we will see this later when we do the [ɛə]-[æ] distinction, which similarly expanded.
- I suspect that some of the “wrong” [ʌɪ] cases are often in frequent words—where rapid speech produces a semi-reduced higher vowel, with likelihood of phonemic misinterpretation.

[aɪ] *idol, bridle*

[ʌɪ] *cider, spider*

- Moreover, there are words, sort of, that *always* bear strong stress: the focus allomorphs of function words.
 - Thus *like* with [aɪ]; similar to *can*, later on.

27. Some old phonotactics survive

- No cases of [ʌɪ] before voiced fricatives or word-final [ʌɪ] — least likely places to get a phonetically short vowel.

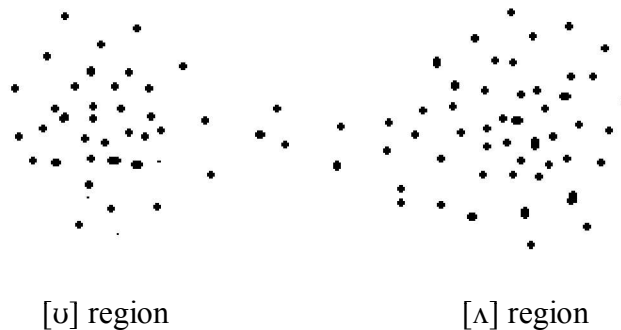
28. One possible view on [ʌɪ]

- For the speakers, /aɪ/ and /ʌɪ/ *are* phonemes—distinct perceptual categories, with all the advantages for discrimination that pertain thereto.
- But they are *new* phonemes, and people aren’t sure which words should have which.
 - I.e. phonemicity is not at issue, but **incidence** is.
- In cases of uncertainty, people collect generalizations, producing semipredictability about distribution.

- cf. islands of reliability (Albright 2002, Albright and Hayes 2003) for morphology; Hayes, Zuraw et al. (Lg. 2009) on Hungarian vowel harmony
- Correspondence, environment limitations are part of this.

29. Distributional learning of phonological categories

- There are computational guys who can process “clouds” of perceptual tokens and derive from them proto-phonemic categories; one classic paper:
 - Frank Guenther and Marin Gjaja (1996) The perceptual magnet effect as an emergent property of neural map formation. *Journal of the Acoustical Society of America* 100: 1111-1121.
 - Kristine Yu, UCLA dissertation (2011) The learnability of tones from the speech signal.
- This paper models the perceptual distortion caused by phonemicity — tokens are misheard as closer to the phonemic center.
- So, a “barbell-shaped” cloud of tokens — such as, perhaps, earlier English /u/ — are vulnerable to phonemic split, even if they still qualify as a single classical phoneme.



30. A conjecture

- compact blobs of tokens are learned as categories
- Barbell-shaped distributions are learned as *two* categories; even if on deeper grounds the sounds are predictable — “hard” allophones
- I conjecture that hard allophones are the ones highly vulnerable to be converted into crummy phonemes.

31. Can infants backtrack?

- We now know that acquisition of the phonemic system happens very early (six months? Kuhl, Sundara and Breiss), probably distributionally.
- Babies in Rochester will pick up a [aɪ]/[ʌɪ] contrast — can they really expunge it from their lexicon later on?

SUMMING UP THE DETAILS OF /aɪ/ - /Λɪ/

32. A historical scenario

- /Λɪ/ originated as a “non-surface” allophone, based on the core derivation of Chomsky and Halle.
- This suffices to set up two perceptual categories—you can call them phonemes if you like.
 - A barbell-like distribution might also have helped.
- Once there are two perceptual categories, random accidents of language acquisition will place them elsewhere
 - Hearing sounds in words learned from outsiders that mismatch the distribution.
 - Hearing fast-speech reduced versions of /aɪ/ as /Λɪ/.
- As above, sound changes can add new members to the category, boundaries, as in Minnesota aɪ → Λɪ / __ ɪ
- The gradual spread of a crummy phoneme is termed **lexical diffusion**.

33. A radically innovating /Λɪ/ dialects

- From an undergraduate paper by Bryce Wyckoff, describing his own native speech (Essex, Vermont)
- A striking number of migrated /Λɪ/'s, perhaps in every pre-tonic syllable.

Consonant	Following syllable not stressless	Gloss	Following Syllable Unstressed	Gloss	Consonant	Example / Data	Gloss
b	^h ʌɪb	tribe	^h ʌɪ bɪ	fiber	p	ʌɪp	ripe
v	kən ^h ʌɪv	contrive	^h ʌɪ vɪ	ivory	f	n ^h ʌɪf	knife
ð	^h ʌɪð	writhe	^h n ^h ʌɪ ðɪ	neither	θ	p ^h ʌɪθən	python
d	^h ʌɪd	tide	^h ʌɪ ri	tidy	t	ʌɪt	write
g	dʒ ^h ʌɪ ^h gæntɪk	gigantic	^h ʌɪgɪ	tiger	s	m ^h ʌɪs	mice
z	^h saɪz	size	^h saɪzmɪk	seismic	tʃ	ʌɪ tʃəs	righteous
n	^h saɪn	sign	^h ʌɪ ni	tiny	k	l ^h ʌɪk	like
dʒ	oʊ ^h blaɪ dʒ	oblige	^h h ^h ʌɪ dʒɪn	hygiene			
m	p ^h ʌɪ ^h mæ ^h ɪ	primary	^h p ^h ʌɪ mæ ^h ɪ	primary			
l	^h saɪ lo	silo	mə ^h kənt ^h ʌɪl	mercantile			
ɪ	d ^h ʌɪ ^h ɹɛkt	direct (adj)	^h ʌɪ ɹɪʃ	Irish			
ɹ	doesn't exist		^h ʌɪ ɹ	fire			
w	^h ʌɪ ^h wan	Taiwan	^h ʌɪ wə ^h nɪz	Taiwanese			

34. Where are we now? crummy phonemes

- From opaque phonology or sound change — DONE

- Foreign influence: the allophone is promoted to phoneme (Ito/Mester) DONE
- boundary-effect contrasts — DONE
- Sound changes arrested in midcourse
 - I mentioned /ʊ/ vs. /ʌ/ very briefly; let's do a more recent one.

ANOTHER CRUMMY PHONEME FROM INCOMPLETE SOUND CHANGE: /æ/ VS. /ɛə/

35. Who has this as a phonemic distinction?

- Philadelphia (and hence massive amounts of study by William Labov and colleagues). See his:
 - Resolving the neogrammarian controversy. *Language* 57:267-308.
- New York City and its surroundings
- Description, quoting
 - Paul Kiparsky (1995) The phonological basis of sound change. In John Goldsmith, ed., *The handbook of phonological theory*. Oxford: Blackwell.

This rule causes stressed [æ] to become tense (we will write the tensed form as A), regularly before certain tautosyllabic consonants (see (11a), in three words before d (11b) and in scattered words in open syllables (11c):

- (11) a. grAph, pAss, pAth, hAm, mAn
 b. bAd, mAd, glAd (vs. sæd, dæd, læd . . .)
 c. p[æ/A]l, pl[æ/A]net, person[æ/A]lity

- The middle row gives us near-minimal pairs.
- Prof. Patricia Keating; infancy in Philadelphia; later Boston suburbs

36. What does /ɛə/ sound like?

- Various described as “raised”, “tensed”, diphthongized.
- It's variable and in extreme versions (Wells) can be [ɪə] or even [iə].
- Anecdote: I have [ɛə] as an allophone of /æ/; a person in Britain taking my work address over the phone heard *Campbell* as *Kimball*.

37. Historical background

- I'm getting this from the Kiparsky reference just cited.
- See also Wells, *Accents of English* (1982) p. 134

38. Stage I

- The Northeastern cities of the U.S. had a lengthening of /æ/ . Ur-environment:

/ ____ f, s, θ, nt, ns when tautosyllabic

as in *pass, path, laugh, aunt, dance* (vs. e.g. *cap, hat*)

- In Boston:
 - lengthened [æ:] evolved into [a:], the “Park the car in Harvard Yard” vowel.¹¹
 - short [æ] was stable
- In New York and Philadelphia:
 - lengthened [æ:] evolved into [ɛə]
 - short [æ] was stable
 - There were further developments, but let’s first take a break and talk about ...

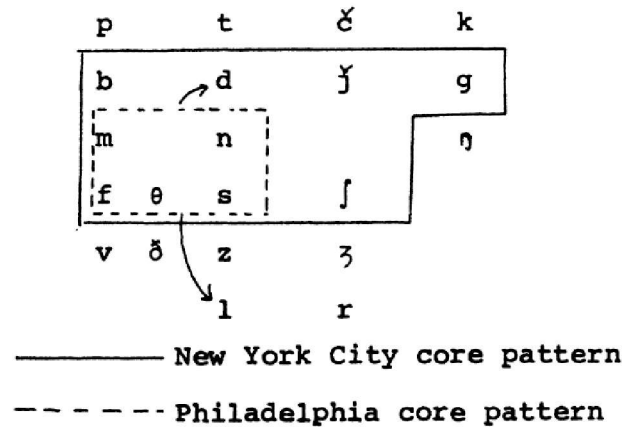
39. Kiparsky: the environments for New York and Philadelphia augmented by “blend ins”

- Visit the nearby inland Americans, like me, who have no /æ/ - /ɛə/ distinction, and you find [ɛə] as a pure allophone.
 - Roughly, the Northern Cities dialects, but I think it goes further than this.
- Here, there is variation in how much you diphthongize (see above on [iə]).
- Variation depends on environment (Kiparsky, following Labov):

nasals	voiced stops	fricatives	voiceless stops
MOST			LEAST
<i>ban</i>	<i>bad</i>	<i>fast</i>	<i>bat</i>

- New Yorkers cloned the inland allophone as a basis for extending the “default” environment for their /ɛə/ phoneme to before (tautosyllabic) nasals, voiced stops, and fricatives.
- Philadelphians borrowed only the prenasal and prefricative cases.
- For both, the trigger had to be tautosyllabic, a restriction retained from the older rule.
- From Labov:

¹¹ Here, the IPA symbol [a] is given its (rare) “official” value; i.e. front and maximally low. Usually it is used informally for a central vowel.



CHARACTERISTICS OF /ɛə/ AS A CRUMMY PHONEME

40. Lexical idiosyncrasy

- Labov 1981 describes a speaker from NYC who has [ɛə] in *bad*, *bag*, and *dance*; [æ] in *half*, *ask*, and *laugh*, and free variation in *pass*
- More generally, speakers disagree with one another quite a bit in which words have which.

41. Spread to novel forms and environments

- *Planet* should not have [ɛə] (open syllable), but this pronunciation is spreading among Philadelphia schoolchildren (Labov).

42. Morphological inheritance

- Classic example

<i>banner</i>	‘flag’	[ˈbæɪnə]
<i>banner</i>	‘one who bans’	[ˈbɛɪnə]

- Kiparsky gives

[ˈmɛɪn-ɪŋ]	<i>manning</i>
[ˈtɛɪn-ɪŋ]	<i>tanning</i>
[ˈhɛɪm-ɪŋ]	<i>hamming</i>
[ˈklɛɪm-i]	<i>clammy</i>
[ˈglɛɪs-i]	<i>glassy</i>
[ˈmɛɪd-ən-ɪŋ]	<i>maddening</i>
[ˈmɛɪd-əst]	<i>maddest</i>

[ˈskɛən-ə] *scanner*

- Inheritance depends on the transparency of the morphological formation involved; hence variation (which puzzles Kiparsky) with his “Level I” affixes in:

class-ify, gas-ify, gas-eous, photograph-ic, mass-ive

all [ɛə] or [æ] depending on consultant or speaking occasion

- If the base has a non-[æ] vowel (due to “deep” phonology), no inheritance:

[ˈsæn-ɪrɪ] *sanity* base has /eɪ/

[ˈspænɪʃ] *Spanish* base has /eɪ/

- If the base has a schwa, no inheritance

[hjuˈmænɪrɪ] *humanity*

[tɑˈtænɪk] *titanic*

- This strikes me as accidental under Kiparsky’s approach: why couldn’t there be a dialect in which /æ/ is tensed on the first cycle, while stressless?
- More generally: inheritance seem to take place “in the flesh”, where an [ɛə] is physically there in a genuinely pronounced base. So, yay for
- OO-Correspondence.

43. Morphological inheritance under hypocoristic truncation

- Source: Laura Benua, U. Mass. diss., (1995)
- This goes backwards, creating /æ/ in closed syllables.

[ˈdʒænət] *Janet*

[ˈdʒæn] *Jan*

44. Override by other rules/constraints

- Strong past tenses are created with [æ].
- This is clear from words that don’t have the tensing environment: *sat, spat, drank, sang, rang* all with [æ] (N.B. [ŋ] although nasal does not trigger [ɛə]).
- So:

[ˈ.æn] *ran*

[bɪˈgæn] *began*

[¹swæm swam

- These compete with tensed versions (Labov)

45. Function words

- These normally have schwa.
- But when pronounced in their full versions, they show unexpected /æ/: *had, am, can*
- Thus a nice minimal pair, [¹kæn] *can* ‘be able to’ / [¹kɛən] *can* ‘metal container’
- Suggestion: the full vowel appears only under emphasis, which would produce a lower output; duly interpreted as the /æ/ phoneme
- Function words tend to have their own phonology anyway (cf. [ð]); so the regular system does not insist on /æ/

46. Affect

- Has been offered by Labov 1981 as an account of /εε/ in *bad, glad, sad*.

CRUMMY PHONEMES: WHAT SORT OF ANALYSIS IS APPROPRIATE?

47. Surely they are phonemes even if they are crummy

48. But the native speaker probably learns to become comfortable with other people who are different

- “Don’t expect faithfulness to the [æ] ~ [εə] distinction when you listen.”

49. The native speaker may also be less confident in his/her own lexicon

- Hence the vulnerability to morphological inheritance effects (which come backed by UG, I suspect).

50. Future research on crummy phonemes?

- Vance’s efforts at collecting **many, many words** were revealing, I think.
- Comparing cosmopolitans with **townies**, sort of like Vance, may be informative. Do these phonemes experience greater security when not infected by the speech of outsiders?
- Further collection might gather **confidence ratings** for each variant, giving a richer form of data to model.
- Judgments of **illegal forms** like *[tʃΛɪ]: I’m not sure any serious work has been done.
- Given Vance’s finding (my own as well) that native speakers easily hear these distinctions, it might be possible to gather scads of data for cheap using the Amazon Mechanical Turk.

SUMMING UP CRUMMY PHONEMES

51. The origins

- Boundary effects
- Opaque phonology or sound change
- Sound changes arrested in midcourse
- Foreign influence: the allophone is promoted to phoneme (Ito/Mester) DONE

52. The theories

- Prosodic domains (perhaps, for German [ç])
- Output-to-output correspondence constraints (for English *fee[t]ing*, etc.)
- Phonotactic theory (for why is it native allophones that get employed to render foreign words)
- Phonetic acquisition theory
- Theories of lexical confidence

Leopold, Werner F., "German ch." in Martin Joos, Readings in Linguistics. New York: American Council of Learned Societies. 1958. Pp. 215-216.
Martin, Samuel E., The Morphophonemics of Standard Colloquial Japanese. Language Dissertation No. 47, Language Supplement. 1952.
Moulton, William G., "Juncture in Modern Standard German," in Martin Joos, Readings in Linguistics. New York: American Council of Learned Societies. 1958. Pp. 208-214.

THE LEVEL SYSTEM

53. The key idea

- The affixes of English can be bifurcated into a *cohering* and a *non-cohering* set.
- For reasons to be made clear, these are often called “Level I” and “Level II”.
- Compounding generally behave as Level I

54. Why we are doing it now

- The “deeper” phonology of English won’t make any sense until we can reliably factor out the effects of these levels.
- There is an obvious research question about the levels (end of the handout) that I believe that no one has yet addressed.

55. The sources

- This distinction is in SPE, where it is expressed with boundary symbols: # vs. +
- Lexical Phonology/Stratal OT, in the research oeuvre of Paul Kiparsky and many influenced by this work.

56. Outline of distribution and behavior

- Much more (not-so-productive?) phonology happens at Level I.
- Only Level I can attach to bound stems: *bucol-ic*, *enorm-ity*
- In multiple affixation, Level II generally external to Level I.
sincer-ity-less is sort of imaginable
**happi-ness-ic* is not.
- Not commonly said, but should be: Level II generally more productive.
 - A prominent theory of productivity: Hay, Jennifer, and Harald Baayen. "Parsing and productivity." In *Yearbook of morphology* 2001, pp. 203-235. Springer, Dordrecht, 2002.

57. A set of affixes generally regarded as Level I

-ity, -ic, -ical, -al/-ar, -(i)ous, -(i)al, -oid, -ate, -ation, -ite

con-/com-, in-/il-/ir-, per-, syn-/sym-

58. A set of affixes generally regarded as Level II

-ness, -less, -ful

-ly, -ing, -s/-z/-əz, -t/-d/-əd

un-, non-

59. Prefixes that have stronger stress as Level II

pre-, sub-

Compare: prehensile, pretonic
submission, sub-human

60. Some tricky borderline cases

-ism/-ist, -able

61. The ordering generalization has problems

- Key reference:
 - Fabb, Nigel (1988) English suffixation is constrained only by selectional restrictions. *Natural Language & Linguistic Theory* 6:527–539
- He went to the trouble of establishing on a case-by-base basis the limitations on affix sequencing.¹²

62. What do we know independently about suffix sequencing?

- Obvious, there are base limitations: *-ness* attaches to Adjectives, *-ing* to Verbs, etc.
- There is *potentiation*: an affix is productive after another affix.
 - *-ify* potentiates *-atory* (in allomorph *-fic*)
 - *-ist* potentiates *-ic*
 - *-ent* potentiates *-y*
- There is *antipotentiation*: don't use a suffix in novel forms unless it is potentiated. This is just non-productivity.
- There are affixes that don't want to attach to affixed forms, e.g.

¹² Again, an early instance of moving beyond the anecdotal.

deverbal -age
 denominal -age
 deverbal -al
 noun-forming -an
 adjective-forming -an
 noun-forming -ant
 adjective-forming -ant
 -ance
 -ate
 denominal -ed
 denominal -ful
 deverbal -ful
 -hood
 denominal -ify
 deadjectival -ify
 -ish
 denominal -ism
 denominal -ist

- Put all this together, Fabb claims, and Level ordering has *nothing more to explain!*

63. Counterexamples to level ordering

- These are discussed in Mark Aronoff's classic (1975) *Word Formation in Generative Grammar*.
- Example: *A¹merican-ist* suggests level 2, but then what of *Americanistic*?

THE PHENOMENA OF LEVEL 1 VS. LEVEL 2 IN ENGLISH: A COMPLETE (??) LIST

I. STRESS

64. Repair of stress lapses

- Defined here as three posttonic, fully stressless syllables.
- Repaired at Level 1:
 - 'medicine ~ me'dicin-al, 'brutal, bru'tal-ity
- Not repaired at Level 2:
 - medicineless, cameraful¹³

¹³ These are somewhat awkward, and we will return to this issue when we discuss Martinian leakage.

65. Repair of unstressed heavy penult

- Repaired at level I
 - 'subject ~ sub'ject + ive
- Not at Level 2:
 - 'subject + less

66. The Rhythm Rule

- According to Kiparsky (1979, LI), in trisyllables with penultimate stress, you can shift stress backward onto a Level II prefix, but not onto a Level I prefix or a stem syllable:
 - Level 2: tri-'county, the ,tri-county 'fair; sub'normal, ,subnormal 'temperature
 - Level 1: in'sipid, *,insipid 'coffee; sub'jective, *,subjective 'feelings
 - Stem: Mon'tana, ??,Montana 'cowboy; Day'tona, ??,Daytona 'Dan

II. SEGMENTAL ASSIMILATIONS**67. /n+l/ repair**

Level 1:

in+legal → illegal [ɪ'ligəl]

Level 2:

un+licenced → unlicensed, *ulicensed

68. Nasal place assimilation

Level 1:

con + pel → compel, in + perfect → imperfect

Level 2:

un + polished → unpolished (fast speech assimilation gives blended [mn] segment)

69. Degemination

Stems

no geminates at all

Level 1

con + note → single [n], [kə'nout]

in + numerable → single

Level 2

un + known → double

non + notable → double

dis + satisfied → double

fine + ness → double

towel + less → double

PHONOTACTIC LIMITATIONS

70. Prevocalic [ŋg]

- Stems:
 - We've already seen it is ok but rare when ambisyllabic: *Singapore*.
- Level 1:
 - Pre-tonically, there is one morpheme that calls for epenthesis to repair the damage
 - prolong [ŋ], prolongation [ŋg], elongate [ŋg]
 - There are two irregular comparatives (irregulars are normally considered to be Level 1) that alternate: long [ŋ], longer [ŋg], stronger [ŋg]
- Level 2:
 - The intuition may be tricky but try this nonce form: Hong Kongese ("the variety of Cantonese spoken in Hong Kong")

71. Prevocalic Schwa

- Quite illegal in stems: "Hello, my name is *[,manə'oumə]."
- At level 1, [ə] is quite regularly deleted before a vowel:
 - Americ-an, delt-oid, enigma-atic, hypochondri-ac
- Legal level 2 forms:
 - Kafkaesque, rhumba-ing

72. Consecutive sibilants

- Quite illegal in stems: "Hello, my name is ['fɪsʃəm]."
- Repaired at Level 1:
 - con+sent, dis+tend, but dis+sent [s]
- At Level 2, repaired if unsyllabifiable:
 - maze+/z/ → mazes
- Else tolerated:
 - mis-shapen [sʃ]

ALLOPHONES AND QUASI-ALLOPHONES

73. /aɪ/ raising

- Applies for unproductive affixations (perhaps Level 1): bicycle
- But not at Level 2, even when the next vowel is stressless:
 - bi-tyrannosauric, anti-toboggan both with [aɪ]

74. Tapping

- I can't find any examples triggered by prefixation, but with suffixes quite common:
 - anecdot-al, [r] acrobat-ic [r]
- Level 2: see again bi-tyrannosauric, anti-toboggan

MARTINIAN LEAKAGE**75. Key reference**

- Martin, Andrew. 2011. Grammars leak: Modeling how phonotactic generalizations interact within the grammar. *Language* 87.751–770
- Sample result:
 - Geminates are totally illegal at Level 1.
 - They exist at level 2, notably within compounds: *bookkeeper*
 - A study of compounds shows they are *underrepresented* statistically.
- His theory: language learners err slightly; overgeneralizing the Level 1 constraints to apply weakly at higher levels.

76. Some cases above that I strongly suspect show Martinian leakage

- Why is it so rare for verbs to end in two stressless syllables? *LAPSE
 - *jettisoning, monitoring*

77. Prevocalic Schwa

- Why is it impossible for verbs to end in schwa (other than rare denominals like *rhumba* or *samba*)?
- Why are there so few forms like *Kafkaesque*?

78. Consecutive sibilants

- Am I right in thinking that Level 2 forms like *misshapen* are rare?

79. Followup planned for next time: see if these can be proven as real effects