

Class 10, 12/3/20: Experiments and Models on Segments; Summary

1. Assignments

- Schedule your small-audience talk with me if you haven't already.

2. Today

- Pierrehumbert (2003): another perspective on the less-productive segmental alternations.
- Pondering a possible experiment on Managerial Lengthening
- Survey of all we have covered
- Course evaluations

PIERREHUMBERT 2003'S VIEWS ON SEMI-PRODUCTIVE ALTERNATIONS

PRELIMINARY: THE EMPIRICAL SCENE FOR ENGLISH VELAR SOFTENING

3. Taxonomy of cases

- Voiceless-voiced (k ~ s is far more frequent)
 - [k] ~ [s]
 - [g] ~ [dʒ]
- Does base have *-ic* (by far the norm) or otherwise?

4. [k] ~ [s] with an affix

In this sub-list, the base always has the suffix *-ic*.

***-ity* forms**

authentic	authentic-ity
domestic	domestic-ity
eccentric	eccentric-ity
elastic	elastic-ity
electric	electric-ity
public	public-ity
specific	specific-ity
toxic	toxic-ity
opaque	opac-ity

-ine forms

medic(al) medic-ine
 plastic plastic-ine

-ize forms

critic critic-ize
 politic politic-ize
 public public-ize
 romantic romantic-ize

The latter class are taken in *SPE* as an argument for Vowel Shift: the [aɪ] is “really” [i:] and so a good Palatalization trigger.

5. Forms in which the softened velar precedes a palatalizing suffix and appears as [ʃ]

Again, all *-ic*

academic academic-ian
 electric electric-ian
 geriatric geriatric-ian
 logic logic-ian
 magic magic-ian
 music music-ian
 obstetric obstetric-ian
 optic optic-ian
 politic politic-ian
 rhetoric rhetoric-ian
 statistic statistic-ian
 tactic tactic-ian
 technic technic-ian

6. Forms with tacit trigger in the base (mostly *-duce*)

practice practic-able

 deduce deduc-tion
 induce induc-tion
 introduce introduc-tion
 produce produc-tion
 reduce reduc-tion
 reproduce reproduc-tion
 seduce seduc-tion

SPE says this vowel /ɛ#/ is synchronically real; in *duce* words it also triggers the long [ju:] characteristic of open syllables, and the final stress.

7. A few forms with affixal triggers and not *-ic*

All with [d] ~ [dʒ]

demagogue	demagog-ic, demagog-y
analogue	analog-y
analogy	analog-ous

8. Forms with a bound stem and no obvious base

reciproc-al	reciproc-ity
reciproc-ate	reciproc-ity
pharmacology	pharmacist, pharmacy

rig-or	rig-id
reg-al	reg-icide
prodig-y	prodig-al

foc-us	foc-i
fung-us	fung-i

Both of these seem to be in peril; a bit pretentious to soften?

- These forms are not detectible with my software (unless we start doing “affix peel-off” to form bases).
- They reflect the lack of productivity and tricky intuitions for derivation from bound stem.

9. History of Velar Softening

- This is a “borrowed alternation”, occurring because enough words had it in the source languages for loanwords.
- We might have to go all the way back to Classical Latin to find the stage where [ki], [ke], [gi], [ge] were pronounced with actual velars.
- I don’t know this historical linguistics here — at what historical stage of Romance did the original sound change take place?
- French today has [k] ~ [s] (*électrique* ~ *électricité*), [g] ~ [ʒ] (*analogue* ~ *analogique*)
- Other Romance languages also palatalized the Latin velars before front vowels with different results. (☞ [tʃ, dʒ], [θ x])
- The spellings *ci*, *ce*, *gi*, *ge* may be pan-Romance.

10. Spelling

- Everything we said about Vowel Shift and spelling probably carries over; a peril to the study of True Phonology, if that is what we want to do.

PIERREHUMBERT COMMENTARY

11. Ponder the exceptions to Velar Softening

- My searchable database has 350.
- Many are within a morpheme — Velar Softening is a “derived environment rule”
 - These include totally *core* vocabulary, like *kick, kiss, give, guess*
- Some are Level II formations, like *smoky, twiggy*
- But there are even *learned* words that don’t soften.
 - These are Greek in origin and are spelled with a *ch*

psychic
 psychiatric
 psychical
 psychiatrist
 anarchic
 masochistic
 parochial
 catechism
 bronchitis
 masochist
 monarchist
 monarchy
 oligarchy
 hierarchy
 hierarchy
 matriarchy
 patriarchy

- One exceptional example: *Slovakia*, with the nation-name suffix.
- Upshot: we work uphill, perhaps, in proving this alternation productive.

12. The general research problem

- We evaluate a pattern in the lexicon, collecting frequency.
- How can we predict productivity, as evaluated in a wug test?

13. Pierrehumbert on the right sort of frequency

“There is by now abundant evidence that the productivity of an alternation depends on its type frequency (as well as on other factors). Alternations found in extremely few types, such as irregular conjugations for auxiliaries, are not productive no matter how frequently the irregular forms may be used.”

- This is what I have long felt; it would be nice to have a literature survey on this point.
- For a small list as of 2008, see Hayes and Wilson (*LI* 2008, 395)
- Exemplifying the claim about auxiliaries:

➤ *can* ~ *could*: [dræn] ~ *[drud]

“He likes to *dran*. In fact, just yesterday he **[drud].”

14. Pierrehumbert on the naturalness-frequency confound

- Across languages, we find that natural patterns are represented more frequently in the lexicon, making it hard to test the two factors independently.
- “In the light of such research, there is a risk of confusing correlation and cause when interpreting experimental findings such as Hay, Pierrehumbert and Beckman (2004). The high correlation ($r^2 = 0.65$) they report between lexical log frequency and perceived well-formedness could in principle arise from a concealed factor, namely markedness. Possibly, the phonetically simpler clusters are judged to be better because they are simpler and they are also used more often in words because they are simpler.”
- One route to take is to study the unusual: the unmarked-but-rare (Arabic /t/, Latin /b/), the marked frequent (clicks).
- ... or study grossly unnatural stuff like Velar Softening.

15. Naturalness in Palatalization

- There is good typological work here (e.g. D. N. S. Bhat), with strong implicational generalizations.
- *Natural* velar palatalization creates only a noisy front velar.
- This in turn, evolves into many different — usually noisier — things ([tʃ], [ʃ], [s]), perhaps driven by dispersion factors.

16. The frequency-specificity tradeoff in finding structural descriptions

- We can get an environment with “high batting average” by being specific.
- We can get a well-populated environment by being general.
- For Velar Softening, the payoff specific environment is, “in the affix *-ic*”.

17. Pierrehumbert on wug-testing methodology

- Recall Cena’s taxonomy:
 1. Directly elicit (give stem, they give affixed)
 2. Give options and offer a choice
 3. Train on pairs and see how long it takes them to learn
- Pierrehumbert advocates #1:

“Most early studies of derivational morphology ...use concept formation tasks or judgments of words presented in pairs, rather than the wugs paradigm [= #1]. These tasks have the

potential drawback of priming awareness of the regularity being studied through the very design of the stimulus materials. The wugs paradigm, with its open-response format, is more conservative. The materials for this study did not provide any examples of a /k/-/s/ alternation and the subjects were unaware that this alternation was being investigated.”

- I sense: “just ask” is probably best if you can get away with it, but Cena was right to move to the more sensitive #3 (#2 is intermediate) in light of earlier claims of full nonproductivity.
- The way to keep them from focusing on the pattern under study is to offer filler items.

PIERREHUMBERT’S EXPERIMENT

18. Procedure

- Train participants by example to form nouns from adjectives.
- Let them experience -ity and -ness — in non-softening words.
- Otherwise, give them freedom in forming novel words.

19. Mixing in a lot of real words with the wugs

When Anna discovered a new doughnut shop, she was very happy.
For her, a warm doughnut means ?????.

Bob’s short-term bonds were among his most liquid assets. After he
got arrested, he was able to post bail because of his high ?????.

- Perhaps this “activates the rule” in some sense? Seems like perhaps a good idea.
- Also identifies the non-alert participants.

20. Illustrating the possibility of freedom with real words

My brother has always been very frugal. Reusing aluminum foil is
just one symptom of his ?????.
(ANSWER: frugalness OR frugality)

Anthropologists working in Manuka found all the hallmarks of a
caustive society. In fact, it became a textbook example of ?????.
(ANSWER: caustiveness OR caustivity).

21. Wug words for Velar Softening: Three emphasized degrees of Latinity

- Degree 1: the -ic suffix, often amplified with a Latinate prefix.
- Degree 2: no suffix, but learned context
- Degree 3: monosyllabic, often amplified with a native prefix

Halley's comet is a very interponic comet. Its orbital period varies because of its ?????.

Before Pierre stood an electrifyingly hovac sculpture. In his entire career as curator, he had never before seen such a perfect example of ????? .

Inside, the light was so dim it was entirely mork. We couldn't read the instructions in the ?????.

1

22. Studying back formation

The period of Halle's comet varies because of its interponicity. It is a very ????? comet.

In Pierre's entire career as a curator, he had never before seen such a perfect example of hovacity. It was an electrifyingly ????? sculpture.

- This, if productive, is an interesting challenge to Albrightianism.

23. Results

- Under the right conditions, Velar Softening is *very* productive.
 - The subjects try, by attaching -ity to a stem.
 - The stem has -ic.
- It's also reasonably productive even under the medial, suboptimal condition.
- It is probably not productive for non-Latinate targets (though people very seldom tried)
- It is less productive in the backward direction than the forward direction.

24. Theory I: what drives the alternation?

- Not just Markedness: [l] is a more common consonant than [s] in the pre-*ity* environment.
- We need to know that the base has a [k].
- For us: [k] ~ [s] is not very P-map compliant, forcing arbitrariness in the Faithfulness constraints that choose [s] as the winner for /k/.

25. Theory II: the role of accuracy and generality

HYPOTHESIS 1: All other things being equal, the cognitive system prefers generalizations which yield more certainty about the outcome to those which yield less certainty.

¹ Uh-oh — I'm alarmed at the invitation to analogize from *dark*.

HYPOTHESIS 2: All other things being equal, the cognitive system prefers generalizations based on larger sets of examples to those based on smaller sets.

- These seem very sensible and well-supported.
- Existing learning models do very well — too well — with Accuracy Bias
- What remains to be done is developing the mathematical apparatus to appropriately implement Generality Bias.

26. Theory III: no-change is usually favored

- There will almost always be a preponderance of non-alternating paradigms.
- Under Generality Bias, these drag down the preference for the more specific alternating cases.

DESIGNING AN EXPERIMENT

27. The plan here

- We won't get very far in designing this experiment.
- But I hope to emphasize the early stages: research question and rationale.

28. General interest

- Albrightianism: the Single Surface Base hypothesis (Albright 2011 *NLLT* etc.)
- Perhaps, neglect of English phonology as bearing on this theoretical issue
- My interest in redoing English phonology equipped with a fairly complete list of alternations.

29. What have we got empirically, from this course, that bears on this?

- Restoring lax vowels ($\text{ə} \rightarrow \text{ɑ}$ in $[\text{'æ}\text{r}\text{ə}\text{m}]$ *atom* \sim $[\text{'ə}\text{'tɑ}\text{m}\text{ɪ}\text{k}]$ *atomic*) seems to be an unfruitful exercise; other than *consonantal* $[\text{ɛ}]$ they restore **etymologically**
 - The only regularities are based on the presence of an “inner” suffix like *-ent* or *-ology*.
- But we do have one possibly-interesting generalization:
 - Managerial Lengthening normally involves an alternation with schwa in the base form, not a full vowel.
 - This seems very Albrightian: it applies as a helpful predictive subcase of Hayes (1995)'s rule: $\text{ə} \rightarrow$ full vowel / when stressed

30. Looking at the data

- The incipient English Segmental Alternation Database
- Here are all the cases of Managerial Lengthening as they apply to a stressed (full) vowel:

➤ [ɛ] to [i:]

no cases (hypothetical: *marmoset* ~ *marmosetian* ‘pertaining to marmosets’)

➤ [æ] to [eɪ]

Arab	Arabian	(in rural speech only) ²
[¹ eɪ.ɹæb]		(perhaps such speakers say [eɪ.ɹæbiən]?)
Iran	Iranian	(ditto)
[aɪ.ɹæn]		

➤ [ɑ] to [ou] (1)

Amazon	Amazonian
for some?	
¹ Ore.gon	Oregonian

- Restoration of stressless vowels:³ (total 39)

➤ Schwa to [i:] (6)

manager	managerial
artery	arterial
minister	ministerial
remedy	remedial
comedy	comedian
mystery	mysterious
funeral	funereal
Abel	Abelian

➤ Schwa to [eɪ] (10)

advantage	advantageous
-----------	--------------

² Mark Twain gives “A-rab” to convey the pronunciation of his rural character Huckleberry Finn.

³ Note: for the cases before [ɪ], the assertion of length is valid only for conservative dialects that preserve vowel length distinctions in open syllables before [ɪ]; e.g. that make distinctions like *Mary* [¹me:ɪ], *merry* [¹mɛɪ], *marry* [¹mæɪ]; similarly *victorious* [vɪk¹to:ɹiəs] vs. *historical* [hɪs¹tɑ.ɹəkəl].

courage	courageous	(normative dialects)
Arab	Arabian	
Canada	Canadian	
episcopal	episcopalian	
Jordan	Jordanian	
fallacy	fallacious	
courage	courageous	
ovary	ovarian	
marginal	marginalia	

➤ schwa to [ou] (23)

colloquy	colloquial
colony	colonial
custody	custodial
custody	custodian
Mongol	Mongolian
Newton	Newtonian
theology	theologian
felony	felonious
harmony	harmonious
melody	melodious
ambassador	ambassadorial
conspirator	conspiratorial
dictator	dictatorial
editor	editorial
equator	equatorial
memory	memorial
professor	professorial
senator	senatorial
tutor	tutorial
Gregory	Gregorian
history	historian
meteor	meteoric
victory	victorious

➤ Schwa to [aɪ]

We don't expect any; high /ɪ/ does not undergo Managerial Lengthening, as it would if we had *academician* [ˌækədə'maɪfən], *Sicilian* *[sɪ'saɪliən]

31. How many cases of non-alternation are there?

- Seeking short vowels / ____ Cɪə, I found: *Machiavellian*, *Orwellian*, *gaseous*
- Part of the problem is that a short vowel, in a position where it could be “vacuously restressed”, is not regular for stress except in monosyllables — which are not common as Latinate stems.
- More monosyllables, perhaps nonce:

- “Kahnian”, would definitely would have to retain its [ɑ].
- “Mennian”, not [i:]

32. More data could be found at

- https://en.wiktionary.org/wiki/Category:English_words_suffixed_with_-ian
- about 2300 words

33. Proposed native-speaker generalization

- Managerial Lengthening preferentially affects vowels that are unstressed/reduced in the base.
- Thus:
 - *Orw[ɛ]llian* is the productive pattern for stressed-vowel potential Managerial lengthening cases.
 - *Norpon* [ˈnɔ:pən] ~ *Norp[ou]nian* is the productive pattern for stressless-vowel potential Managerial Lengthening cases.
 - In contrast, Trisyllabic Shortening readily affects stressed vowels: *Valentine* ~ *Valent[ɪ]nian*

34. What experimental paradigm might reveal some kind of effect?

- Let us be conservative (in the Cenian sense, not the Pierrehumbertian).
- I.e. do an experiment where if we find nothing meaningful, we can give up and work on something else.
- Hence, a paradigm-memorization study; type 3 in the taxonomy given earlier.

35. Cena's principle

- Don't include identity among the options.
- E.g. if we test:
 - [ˈvou,zən] ~ [ˈvou,zaniən] against
 - [ˈvou,zən] ~ [ˈvou,zouniən]
 we should not be too surprised if [ˈvou,zaniən] is easier to learn.

36. Instead, commute the three long vowels

- Learn one of these:
 - [ˈvou,pən] ~ [ˌvouˈpouniən]
 - [ˈvou,pən] ~ [ˌvouˈpemiən]
 - [ˈvou,pən] ~ [ˌvouˈpi:niən]
- And with the other two possible base vowels:

- ['fə:gæn] ~ [fə'gouniən]
- ['fə:gæn] ~ [fə'gemiən]
- ['fə:gæn] ~ [fə'gi:niən]
- ['bɔ:ɪfən] ~ [bɔ:ɪ'founiən]
- ['bɔ:ɪfən] ~ [bɔ:ɪ'femiən]
- ['bɔ:ɪfən] ~ [bɔ:ɪ'fi:niən]

37. Adding in the comparison set: schwaful bases that engage in real-life alternations

- ['kɪɪmən] ~ [kɪɪ'mouniən]
- ['kɪɪmən] ~ [kɪɪ'memiən]
- ['kɪɪmən] ~ [kɪɪ'mi:niən]

- *All three* are “potentially correct”.

38. Notes

- Of the options in (36), we might expect the [ə] ~ [ou] forms to be easiest, since this pattern is the most frequent.
- We might want to avoid, or control for, the endings *-ton* and *-son*, both common in surnames, which so readily undergo Managerial Lengthening (cf. the role of base suffixes in lax vowel restoration).

39. We need an all-auditory experiment

- due to orthography (did you make up spellings for (37)?)

40. We might benefit from the use of a few frames

- I would assume the frame should help establish the lexical stratum — Latinate — that most encourages alternation.
- Cf. Pierrehumbert, who bravely employed both maximal-Latinate and intermediate-Latinate.
- A possible Latinate frame:

“We interviewed Prof. ['kɪɪmən], who is famous for inventing the [kɪɪ'mouniən] aerodynamic model.”

- After a couple frames, we could just switch to pairwise learning (respond to name as prompt).

41. We need a lot of filler items

- ... per Pierrehumbert, to keep them from overtly conceptualizing their task.
 - See recent work by Elliott Moreton and Katya Pertsova on “aware” vs. “non-aware” participant behaviors.

42. Form of presentation

- It seems tricky to do a pattern-learning experiment without risking the Clever Hans effect.
- Perhaps the experimenter could sit outside a booth, listening, and click buttons?
 - “Correct. Please go on.”
 - “Incorrect. The correct answer is X”
- My intuitions rebel against this coldness, and I also suspect that a physically present experimenter motivates the participant to pay attention and engage their abilities.

43. Post experiment interview questions

- “Did you find some sort of strategy to guide you in learning?”
- “Did you make up spellings in your head for the words you were learning?”

44. This experiment falls into an odious class you are supposed to avoid

- It’s only interesting if the outcome comes on in a particular direction.
- If the schwaful bases like (37) are easier to learn, this is plausibly because speakers are familiar with and have internalized schwa - long vowel alternations — per Albrightian theory.
 - The full-vowel/full-vowel alternations might *seem* easier, but they are poorly attested and thus poor candidates.⁴
 - See analysis below
- If the full-vowel bases like (36) are easier to learn, there are multiple explanations:
 - Participants visualize the orthography “on the fly” and use it to make their choice.
 - Participants prefer phonetically less drastic alternation (where reduction = drastic)
 - [and fascinatingly:] *SPE* is right: learn cobbled UR’s in childhood, and apply Managerial Lengthening (in the usual case) to abstract underlying full vowels. But when you have a schwa in the base, you have to guess what that vowel is.

45. We should also have an analysis up our sleeve in case the experiment comes out in the interesting direction

- I suggest a Paradigm Uniformity explanation: an overt vowel in the base makes us want to use the same vowel in the derivative.

⁴ Note, however, the problem observe earlier: both alternation and cases of non-alternation are rare, so the denominator for a probability estimate is small.

- Note that this is not true in general for Trisyllabic Shortening, so we will need constraint ranking/weighting — Paradigm Uniformity is a TETU effect.
- We also have the usual problem (since Zuraw 2000) of needing a grammar that both generates probabilities for novel forms and invariant outcomes for existing forms.

46. Constraints

TRI	Vowels must be short in the environment / ____ ɔ̃ σ
*STRESSED SCHWA	
FAITH-OO(vowel quality)	Vowels in correspondence must match in features.
MANAGER(i:)	[ə] in base forms must be matched by [i:] / ____ C iə
MANAGER(eɪ)	[ə] in base forms must be matched by [eɪ] / ____ C iə
MANAGER(oʊ)	[ə] in base forms must be matched by [oʊ] / ____ C iə
USE LISTED	Deploy listed lexical entries without change.

- The “Manager” constraints are of the “Anticorrespondence” type I once suggested (Hayes 1999, my website).
- I assume they are credits, with negative weights.

47. Tableau

			Tri	*Stressed Schwa	Faith (vowel quality)	Manager (i:)	Manager (eɪ)	Manager (oʊ)	Use Listed	
			50.0	35.1	39.8	-24.0	-24.5	-25.3	13.0	p
Ab[ə]l+ian AS TYPE	A'b[i:]lian	6			1	1				0.154
	A'b[I]lian				1					0.000
	A'b[eɪ]lian	10			1		1			0.256
	A'b[oʊ]lian	23			1			1		0.590
	A'b[ə]l+ian			1						0.000
Orw[ɛ]ll+ian	Orw[ɛ]llian	1								1.000
	Orw[i:]llian				1	1				0.000
ser[i:]ne+ity	se'r[ɛ]nity	1			1					1.000
	se'r[i:]nity		1							0.000
Ab[ə]l+ian AS ENTRY	A'b[i:]lian	1			1	1				1.000
	A'b[ɪ]lian				1				1	0.000

	A'b[ɛɾ]lian				1		1		1	0.000
	A'b[ou]lian				1			1	1	0.000
	A'b[ə]l+ian			1					1	0.000

48. An earlier parallel from Ito and Mester (1996)

Correspondence and Compositionality: The Ga-gyo Variation in Japanese Phonology
in: Roca, Iggy, ed. *Derivations and Constraints in Phonology*. Oxford University Press.

In conservative Tokyo Japanese, /g/ is realized as the allophone [ŋ]⁵ intervocalically:

(8) a. Initial g:

✓[g]	*[ŋ]	
geta	*ŋeta	'clogs'
giri	*ŋiri	'duty'
guchi	*ŋuchi	'complaint'
go	*ŋo	'(game of) Go'
garasu	*ŋarasu	'glass'

b. Internal ŋ:

*[... g ...]	✓[... ŋ ...]	
*kagi	kaŋi	'key'
*kago	kaŋo	'basket'
*kaŋgae	kaŋŋae	'thought'
*sasageru	saŋaŋeru	'give'
*uŋuisu	uŋuisu	'(Japanese) bush warbler'
*tokage	toŋaŋe	'lizard'
*igirisu	iŋirisu	'England'

Optional paradigm uniformity effect for compounds with second member in [g]:

(17) Compounding with g-initial Stem₂: optional VVN

geta	'clogs'	niwa	+ $\begin{smallmatrix} g \\ \eta \end{smallmatrix}$	eta	'garden clogs'
goro	'grounder'	pitchaa	+ $\begin{smallmatrix} g \\ \eta \end{smallmatrix}$	oro	'a grounder to the pitcher'
gara	'pattern'	shima	+ $\begin{smallmatrix} g \\ \eta \end{smallmatrix}$	ara	'striped pattern'
gei	'craft, art'	shirooto	+ $\begin{smallmatrix} g \\ \eta \end{smallmatrix}$	ei	'amateur's skill'
go	'Go game'	oki	+ $\begin{smallmatrix} g \\ \eta \end{smallmatrix}$	o	'Go played with a handicap'

No such thing for compounds where second member starts with /k/, and is eligible for Rendaku:

⁵ Actually, [ŋ] is a "crummy phoneme", in the sense addressed in Week 1.

(18) Compounds involving Rendaku: obligatory VVN

kuni	‘country’	yuki	+ { ^ŋ / _{*g} }	umi	‘snow country’
kami	‘paper’	ori	+ { ^ŋ / _{*g} }	ami	‘origami paper’
kaeru	‘frog’	gama	+ { ^ŋ / _{*g} }	aeru	‘toad frog’
kenka	‘fight’	oyako	+ { ^ŋ / _{*g} }	enka	‘parent-child fights’
kaki	‘writing’	yoko	+ { ^ŋ / _{*g} }	aki	‘horizontal writing’
kusuri	‘medicine’	nuri	+ { ^ŋ / _{*g} }	usuri	‘medical ointment/cream’
kirai	‘dislike’	onna	+ { ^ŋ / _{*g} }	irai	‘woman-hater, misogynist’

The parallel:

	English	Japanese
OO-Faith	Vowel quality	nasality on stops
Can enforce OO	ε of <i>Orwell</i>	g of <i>niwa-geta</i>
Cannot enforce OO	ə of <i>Abel</i>	k of /ori-kami/ → [oriŋami]
Reason for above	*STRESSED SCHWA	RENDAKU (*[niwa-keta])

49. Our analysis ideally will be learnable, too

- Since this is all based on the relative frequency of schwa restoration vs. other cases, we need to formalize generality bias, per above.
- Hence, a full version (with a full lexicon) will hit Zuraw’s Problem:
 - How to simultaneously learn the patterns of the lexicon along with the lexical entries.
 - Zuraw’s Problem currently being attacked head-on by Claire.

COURSE SUMMARY

50. SPE came up a lot

- I really respect the detail with which it took on English phonology — many things we never got to.
- I also got, from my rereading, a sense of frequent weirdness.
 - Priority given to seemingly peripheral facts, like Vowel Shift.
 - Letting this tail wag a big dog (underlying /œ:/ for [ɔɪ])
 - Ignoring the strength of data patterns (Vowel Shift as applied for [aʊ] ~ [ʌ])

- Corpus-rationalizing, rather than speaker-characterizing analysis (despite being written amidst Chomsky's clarion calls for psychological realism in syntax)

51. A paean to diachrony

- English diachrony has been studied for a long time with great dedication.
- So we get a full, illuminating alternative perspective on “why things are the way they are”
- And this reveals to us unnatural (telescoped) generalizations we can test for psychological reality (ex.: the “stress a penult before [ʃ]” constraint).
- Knowing the post-1600 diachrony lets you understand the relationship between dialects; useful for Intro and also perhaps a future research topic.

52. Ambisyllabicity

- The big research puzzle is why this one configuration regulates so many things:
 - Allophones
 - a subset of the phonotactics
- Repeatedly, we saw examples of the Fivefold Way
 - a. Strict onset
 - b. Onset of any kind
 - c. Ambisyllabic
 - d. Coda of any kind
 - e. Strict coda

53. Phonotactics

- Alas we only covered this for the ambisyllabic clusters (homework) but the topic is huge, challenging, unresolved for both description and theory.

54. Crummy phonemes

- We went with a four-way taxonomy
- Opaque phonology or sound change
 - English [aɪ]/[ʌɪ], in *Vance*
- Sound changes arrested in midcourse
 - /ʊ/ in *put*, /ɛə/ in *sad*
- Foreign influence
 - Bruce's four low vowels: /æ/, /a/, /ɑ/, /ɔ/, where /a/ occurs in fancy foreign words before /l/: *pally*, *Pali*, *Polly*, *Pauley*
 - Foreign exposure promotes our allophones into phonemes.
- Morphological structure
 - *Ely* vs. *eely*

55. The influence of morphology

- Can the old Kiparskian Level I/Level II distinction be maintained/rehabilitated?
- We tried to put all the evidence together in one place.
- As a principle of affix ordering, it seems quite inadequate, but there's still a lot to be said.
- Martinian leakage: the inner levels bleed into the outer ones as weak stochastic phonology (e.g., avoiding geminates gradiently in compounds)
 - We tried to extend Martin: *TRIPLE LAPSE making certain plurals (*Copernicuses*) rather awkward (no significant result); *mis-* underattaches to sibilant-initial stems.

56. English stress: what matters?

- Weight, in three (perhaps four) categories.
- Spacing of stresses, against each other, against the edges
- Avoidance of clash
- Avoidance of subminimal feet (=pretonic or final light stressed syllables)
- Particular affixes
- The level system
- Inheritance (cyclic effects)
- Choice of main stress: rightward seeking, but subject to various non-finality principles

57. Analysis

- We found this tough under any set of assumptions: we must search the data digitally and try hard to check every single case.
- Pater (2000) got scrutinized fairly arduously and turned out to need rather little repair, despite its journal-article length.
 - Our full version set the World's Record (per Bruce) for Classical OT constraint - ranking depth.
- My own MaxEnt spreadsheet kept getting bigger and bigger (as accuracy improved)

58. Four theoretical approaches

	Single-solution nonstochastic	Stochastic
Ingredients given by a UG	Pater (2000)	Moore-Cantwell 2015
Ad hoc ingredients allowed	SPE, Liberman and Prince	Hayes, this course

- The right column is, I think, the revolutionary development this century; it depends on ganging and for analysis on Harmonic Grammar.
- Idea first put forth in Guion et al, established more firmly with Claire's work.
- The columns represent one of the central controversies of our field (top row: McCarthy/Prince, perhaps *SPE*)

59. On the cycle

- It has only one phenomenon supporting it in *SPE*, but 52 years of subsequent research indicates about seven, which we covered.

60. The axolotl/Aristotle mystery

- Words with these tiny final syllables act as if these syllables weren't even there.

61. The “Sonorant Destressing” mystery

- Data pattern very complicated — how learned?
- Main stress cares about potentially clashing secondary stress.

62. Making a big MaxEnt model facilitates discovery and validation

- E.g. the Moore-Cantwell “antepenultimate with final [i]” constraint worked fine.
- *Stress in hiatus
- *Stress before V∫V#
- The Kelly/Ryan effects of branching or null onsets
- Weaker nonfinality in disyllables

63. Testing stress

- Increasing sophistication on many fronts.
- We played with matching models to stress, with only partial success.
- Bruce likes the Guionian method for averting orthography; worried about the Faithfulness problem of vowel reduction.

64. The primary segmental alternations

- An attempt, still only partially successful, to find them all by using the orthography.
- The basic lengthening and shortening rules
- A tour of one of the more lurid parts of *SPE* (tail wags dog violently)

65. Albrightianism, cobbling, and vowel reduction

- Very limited success in inventing a ‘vowel restoration’ grammar.
- But enough on Managerial Lengthening to suggest the experiment described today.

66. Experimental method

- A quick and informal survey, based on the papers that have studied stress patterning and vowel alternations.

67. Course evaluations