Class 8 (Week 4, T): Sideways interfaces III, getting evidence

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To do
☐ Read **Zhang, Lai & Sailor 2011** for Thursday.
☐ **Homework** due a week from Thurs (Oct. 29)

Overview: How can we find out what generalizations are real to the speaker? How can we find out whether some generalizations are "better" than others (from a learner/speaker's perspective)?

1. Descriptive adequacy

- A <u>descriptively adequate grammar</u> of a language captures the psychologically real generalizations of that language
- So how do we know which generalizations are real?
- Example: English plurals

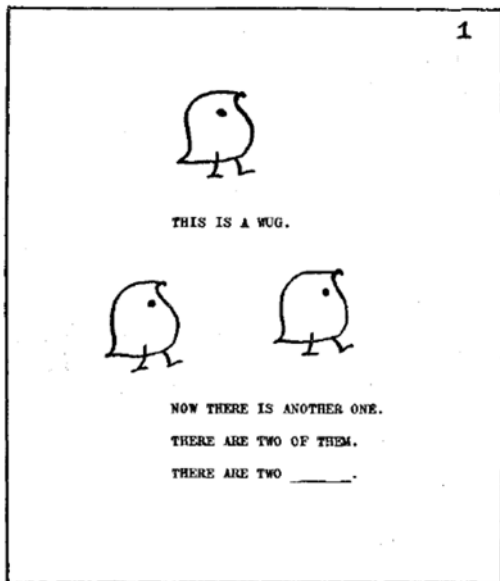|					
cat	kæt	kæts	*pea*	pi	
sack	sæk	sæks	*cow*	kaʊ	
dog	dɑg	dɑgz	*man*	mæn	
grub	gɹʌb	gɹʌbz	*foot*	fʊt	
dish	dɪʃ	dɪʃɨz	*wife*	waɪf	
fudge	fʌdʒ	fʌdʒɨz	*whiff*	wɪf	

Figure 1.   The plural allomorph in /-z/.

- Berko's English-speaking adults (all highly educated) consistently gave the following plurals when presented with invented words (pp. 155-158):

wʌg	wʌg**z**	lʌn	lʌn**z**
gʌʧ	gʌʧ**ɨz**	nɪz	nɪz**ɨz**
kæʒ	kæʒ**ɨz**	kɹɑ	kɹɑ**z**
toɹ	toɹ**z**	tæs	tæs**ɨz**
hif	hi**fs**, hi**vz**		

(Berko 1958, p. 154)

o Conclusions we could draw about what a descriptively adequate grammar for English should look like?

2.   Why is it hard to develop a descriptively adequate grammar in phonology?

- Words that the speaker already knows are uninformative!
    - They don't tell us anything about what generalizations the speaker has learned—she may have simply memorized that word.
- Constructing novel phonological situations to put speakers in is difficult.
    - Contrast this with syntax, where it's easy to construct sentences that—presumably—the speaker has not encountered before.
    - o Discuss: phrasal phonology?

- If you took Ling 201A last year, you had guest lectures from Robert about loanword and L2 phonology
    - This seems like the perfect way to put speakers in a novel situation—like a natural wug test
    - o What are some reasons it could be problematic though?

3.   Limits of descriptive adequacy

- It's important to know that obstruent voicing assimilation and intersibilant epenthesis are really psychologically real (at least for /-z/ suffixation).
    - tells us something about the grammar of English
    - tells us that these processes are learnable, given the kinds of data available to English L1 learners
- But knowing that doesn't tell us anything about what learners might *prefer*
    - Is there any sense in which voicing *as*similation is "better" than voicing *dis*similation?
    - We might expect it to be, given that it's more widespread, and phonetically motivated.
    - But can we get evidence?

4. Explanatory adequacy

- Let a <u>linguistic theory</u> be a function that, given a finite set of utterances (the <u>learning data</u>), produces a grammar.[1]
- An <u>explanatorily adequate theory</u> is one that will, given typical learning data, return a descriptively adequate grammar
- To build our linguistic theory, we need to know which generalizations people tend to extract from learning data.
    - Are some preferred to others?
    - Are there hard limits on learnability?

How can we investigate this...

5. Typology?

- Chomsky & Halle 1968 proceed more or less according to this logic:
    - Assume that languages change when members of one generation learn a slightly different grammar from the grammar that generated the data they were exposed to.
    - Further assume that these changes involve learners' constructing a more-preferred grammar than what would be strictly consistent with the learning data.
    - Therefore, if a certain phonological phenomenon is predominant cross-linguistically, it must be because learners prefer it (and therefore have introduced it into many languages).
    - Thus, we can tell what learners prefer by inspecting cross-linguistic tendencies.

o I'm sure you can poke some holes in this—let's discuss (see (Blevins 2003), (Ohala 1992))

6. Poverty-of-the-stimulus experiments

(See Wilson 2006, White 2013 for other nice artificial-language cases; Zuraw 2007 for a real-language case.)

- Kim 2012: Teach people two alternations in an artificial language:
    - map**i** + alop + a → mapalopa ('dog's kiwi')
    - na**t** + ipul + a → nat∫ipula ('monkey's watermelon')

- In testing phase, sneak in some items like
    - kito + ilip + a → ?

o Discuss possible outcomes and what they'd tell us.

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[1] Chomsky's definition of a linguistic theory is sometimes weaker: it need only define the set of possible grammars, independent of learning data (then the learner still needs a way to select the best grammar, given the data). This allows him to define the term **descriptively adequate theory**, which is a theory that includes, as possible grammars, a descriptively adequate grammar for every language—but does not necessarily return that grammar given learning data for that language. (If I understand Chomsky 1965, pp. 25-37, and other works correctly.)

7. Surfeit-of-the-stimulus experiments

- Recall Turkish voicing from last week:
  - (3)　a.　Alternating root-final plosive:
kanat	'wing'	kanad-ɨ	'wing-Acc'
kanat-lar	'wing-pl'	kanad-ɨm	'wing-1sg.poss'
    - b.　Nonalternating voiceless plosive:
sanat	'art'	sanat-ɨ	'art-Acc'
sanat-lar	'art-pl'	sanat-ɨm	'art-1sg.poss'
    - c.　Nonalternating voiced plosive:
etüd	'etude'	etüd-ü	'etude-Acc'
etüd-ler	'etude-pl'	etüd-üm	'etude-1sg.poss'

  (Inkelas 1995, p. 3)

Becker, Ketrez & Nevins 2011:

- Turkish speakers could have learned various generalizations about whether a final obstruent alternates in voicing under suffixation.
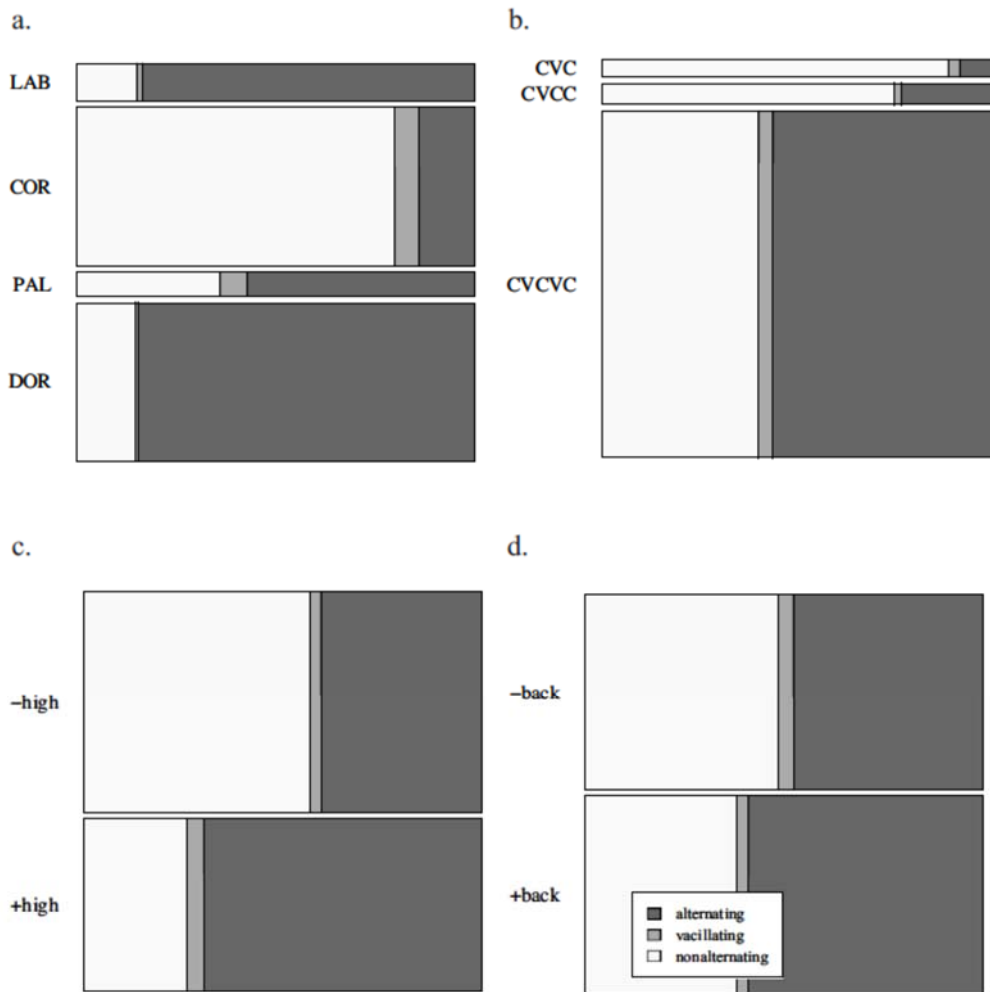 - place of final C, shape of root, height or backness of last vowel

FIGURE 1. Alternation rates in the lexicon, by single features.

(p. 89)

- But which of these lexical trends have they actually learned?

- Though there is a trend for the height effect, only the place and shape effects contributed significantly to the regression model.
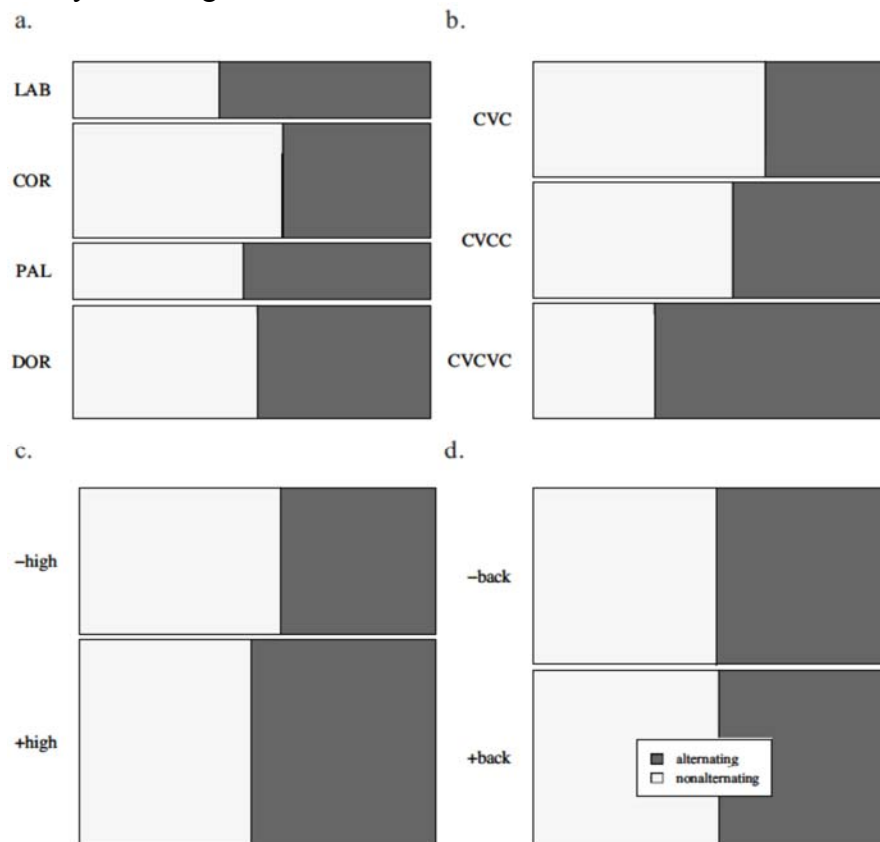

FIGURE 4. Alternating choices for nonce words, by single features.

(p. 100)

- Becker & al.'s conclusion
  - constraints like *VpV exist, and people can learn to rank/weight them highly.
  - constraints like *[V,+hi][C,-voice]V don't exist
    - Maybe too strong: see Hayes et al. 2009 for a case where "unnatural" constraints do show an effect on nonce words, just not a strong one

8. Processing of native-language rules (Zhang & Lai 2006)

(2) Mandarin tone sandhi:

   a. 213 → 35 / ___ 213

      xaw213-tɕju213 → xaw35-tɕju213   'good wine'

      tʂan213-lan213 → tʂan35-lan213   'exhibit'

   b. 213 → 21 / ___ {55, 35, 51}

      xaw213-ʂu55 → xaw21-ʂu55   'good book'

      xaw213-ɻən35 → xaw21-ɻən35   'good person'

      xaw213-kʰan55 → xaw21-kʰan51   'good-looking'

(Zhang & Lai p. 80)

- Various reasons to think that rule (b) should be "better" than rule (a):
  - Both rules simplify a complex contour, so that it is easier to realize in a shorter time (being nonfinal makes the first word shorter)—see (Zhang 2000).
  - But (a) also involves raising of pitch, which increases articulatory demands in a short time.
  - (b), on the other hand, involves straightforward simplification of the original tone
  - (Zhang & Lai discuss other reasons...)
- Mandarin speakers use both rules very frequently—but is (b) nevertheless "easier" than (a)?

Experiment
- Zhang & Lai presented Mandarin speakers with a variety of real and "wug" combinations.
  - Subjects hear two syllables and have to pronounce them as a single word.

rule (b)   rule (a)   rule (b)   rule (a)
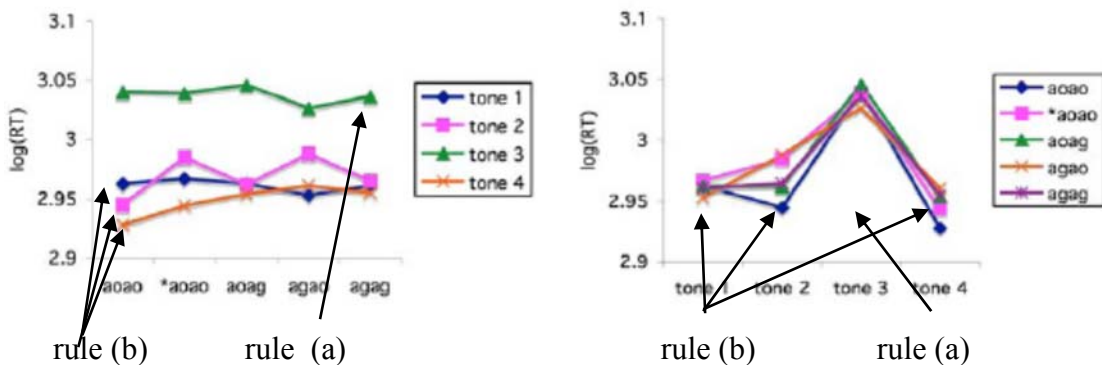
(Zhang & Lai p. 96)

- Subjects responded <u>more slowly</u>—higher log(ReactionTime) values—when applying rule (a), for all types of words (real and "wug").
  - (There are other interesting results concerning how the words were produced.)

- Zhang & Lai's conclusion: Mandarin speakers have learned both rules, but have more difficulty using the "unnatural" one.

9.   Next time

- Whatever we didn't get to from today
- Plus, evidence from word choices that people make in literature, song, and normal speech

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