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

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

<table>
<thead>
<tr>
<th>Word</th>
<th>Realization</th>
<th>Realization</th>
</tr>
</thead>
<tbody>
<tr>
<td>cat</td>
<td>kæt</td>
<td>kæts</td>
</tr>
<tr>
<td>sack</td>
<td>sæk</td>
<td>sæks</td>
</tr>
<tr>
<td>dog</td>
<td>dag</td>
<td>dagz</td>
</tr>
<tr>
<td>grub</td>
<td>ɡˈʌb</td>
<td>ɡˈʌbz</td>
</tr>
<tr>
<td>dish</td>
<td>ˈdɪʃ</td>
<td>ˈdɪʃɪz</td>
</tr>
<tr>
<td>fudge</td>
<td>ˈfʌʤ</td>
<td>ˈfʌʤɪz</td>
</tr>
</tbody>
</table>

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

     | Word | Realization | Realization |
     |------|-------------|-------------|
     | wag  | wʌɡ         | lʌn         |
     | gag  | ɡˈʌɡ        | nɪz         |
     | kæz | kæˈzɪz      | kra          |
     | toi | ˈtoʊ        | tæs         |
     | hif | hɪfˈs, hɪvz |              |

   (Berko 1958, p. 154)

   ○ 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.
    - 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
      - 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 assimilation is “better” than voicing dissimilation?
  - 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 *linguistic theory* be a function that, given a finite set of utterances (the *learning data*), produces a grammar.\(^1\)
- An *explanatorily adequate theory* 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:
  - mapi + alop + a → mapalopa (‘dog’s kiwi’)
  - nat + ipul + a → natʃipula (‘monkey’s watermelon’)
- In testing phase, sneak in some items like
  - kito + ilip + a → ?

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

\(^1\) 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:

\[\begin{array}{ll}
\text{kanat} & \text{‘wing’} \\
\text{kanat-lar} & \text{‘wing-pl’} \\
\end{array}\]

\[\begin{array}{ll}
\text{kanad-i} & \text{‘wing-Acc’} \\
\text{kanad-im} & \text{‘wing-1sg.poss’} \\
\end{array}\]

- Nonalternating voiceless plosive:

\[\begin{array}{ll}
\text{sanat} & \text{‘art’} \\
\text{sanat-lar} & \text{‘art-pl’} \\
\end{array}\]

\[\begin{array}{ll}
\text{sanat-i} & \text{‘art-Acc’} \\
\text{sanat-im} & \text{‘art-1sg.poss’} \\
\end{array}\]

- Nonalternating voiced plosive:

\[\begin{array}{ll}
\text{etüd} & \text{‘etude’} \\
\text{etüd-ler} & \text{‘etude-pl’} \\
\end{array}\]

\[\begin{array}{ll}
\text{etüd-i} & \text{‘etude-Acc’} \\
\text{etüd-üm} & \text{‘etude-1sg.poss’} \\
\end{array}\]

(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

![Diagram](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

(2) Mandarin tone sandhi:

a. $213 \rightarrow 35 / \_\_ \_ 213$
   
   xaw213-teju213 → xaw35-teju213  ‘good wine’
   
   tsan213-lan213 → tsan35-lan213  ‘exhibit’

b. $213 \rightarrow 21 / \_\_ \{55, 35, 51\}$
   
   xaw213-ʂu55 → xaw21-ʂu55  ‘good book’
   
   xaw213-ɻan35 → xaw21-ɻan35  ‘good person’
   
   xaw213-ɻan55 → xaw21-ɻan51  ‘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.

(Zhang & Lai p. 96)

- Subjects responded more slowly—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

References


