Class 6: The duplication and conspiracy problems

Overview: Sometimes it looks like multiple parts of the grammar are doing the same thing. Is this bad, and if so can we do anything about it?

0. Business
- Anything?
- [We’ll spend 10 minutes on Malagasy at the end]
- Kie: start the recording

1. Dynamic vs. static phonology
- The ‘dynamic’ phonology of a language is the phonology that shows up in alternations. We have analyzed this with rules:
  
  cat[s] walk[t]
  dog[z] jog[d]
  pea[z] flow[d]

- The ‘static’ phonology is the generalizations that hold of monomorphemic words. Often analyzed with morpheme structure rules/constraints:

  [læps], [lɪst] but no words like *[læpz], *[lɪsd]

❓ Let’s try writing both a phonological rule and a morpheme structure rule for this. Then, let’s see if we can devise an “ordering solution” as you read about in K&K.
2. Conceptual remarks

- Morpheme structure rules/constraints are weird:
  - no one is claiming that the English lexicon actually contains words like /ækd/, repaired by morpheme structure rule to /ækt/
  - after all, on hearing [ækt], why would a learner construct a lexical entry /ækd/ instead of /ækt/?

- But the prohibition on /ækd/ must be expressed somewhere in the grammar of English
  - assuming it is “significant”
  - e.g., if English speakers reject /ækd/ as a new word, or have trouble distinguishing between /ækd/ and a legal alternative.

- Some might claim that the lexicon contains /ækD/, with a final consonant underspecified for [voice].
  - Still, if the morpheme structure rule applies only to underspecified Cs, what would happen to hypothetical fully specified /ækd/? What prevents it from existing??

- This comes back to the ‘lexical symmetry’ idea we saw in K&K’s discussion of Russian final devoicing:
  - The grammar needs to explain, one way or another (phoneme inventory, morpheme structure, or normal rules), why certain types of underlying forms don’t occur.

?? An even weirder case: some English speakers think that /slol/ and /smæŋ/ sound funny.\(^1\) If we tried to write a rule to change them, instead of merely a constraint banning them, what would they change to??

3. Example: Estonian

- Finno-Ugric language from Estonia with 1.1 million speakers
- Official language of Estonia
- Some notable Estonian speakers:

Kelly Sildaru, freestyle skier   Arvo Pärt, composer   Kerli, singer/songwriter

\(^1\) There are few monosyllabic words like this—here are all the examples from the CMU Pronouncing Dictionary, excluding probable proper names. OED has a few more but those were all previously unknown to me.

\[s{p,m}C0VC0(p,b,m)\]: smarm(y), smurf, spam, sperm, spiff(y), spoof

\[s{m,n}C0VC0(m,n,ŋ)\]: shrill, slur, slurp—notice none with /l...l/ or /r...r

\[skC0VC0(k,g,ŋ)\]: skink, skulk, skunk
I’ve seen the basic data cited as being from Prince 1980, but I couldn’t find them there (??).

  - Data below are just spelling [which does not reflect all three length levels], from this Estonian noun decliner: www.filosoft.ee/gene_et, using additional roots from Blevins 2005.

Estonian content morphemes have a **minimum size**: at least two syllables or one “heavy” syllable

  - such as CVV, VV, CVCC, VCC
  - */ko/, */ma/, */kan/ ← no good because they would be a single “light” syllable

Estonian also has a rule deleting final vowels in the nominative sg.:

<table>
<thead>
<tr>
<th>nom. pl</th>
<th>nom. sg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ilma/</td>
<td>ilma-d</td>
</tr>
<tr>
<td>/matsi/</td>
<td>matsi-d</td>
</tr>
<tr>
<td>/konna/</td>
<td>konna-d</td>
</tr>
<tr>
<td>/tänava/</td>
<td>tänava-d</td>
</tr>
<tr>
<td>/seminari/</td>
<td>seminari-d</td>
</tr>
<tr>
<td>/tuleviku/</td>
<td>tuleviku-d</td>
</tr>
<tr>
<td>/raamatu/</td>
<td>raamatu-d</td>
</tr>
</tbody>
</table>

But the rule fails to apply in certain cases:

<table>
<thead>
<tr>
<th>nom. pl</th>
<th>nom. sg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>/pesa/</td>
<td>pesa-d</td>
</tr>
<tr>
<td>/kana/</td>
<td>kana-d</td>
</tr>
<tr>
<td>/koi/</td>
<td>koi-d</td>
</tr>
<tr>
<td>/maa/</td>
<td>maa-d</td>
</tr>
<tr>
<td>/koli/</td>
<td>koli-d</td>
</tr>
</tbody>
</table>

❓ Let’s try to write a mini-grammar for Estonian that tries to capture these facts. What’s unsatisfying about it?
4. **The duplication problem (Kenstowicz & Kisseberth 1977)**

=cases where phonological rules and morpheme structure constraints seem to be doing the same thing (‘duplicating’ each other’s effects).

- These troubled researchers from the late 1970s onwards, because it seems (although we don’t actually know) that a single phenomenon (e.g., avoidance of sub-minimal words) should have a single explanation in the grammar.

❓ Anyone want to offer a summary of how this plays out in Chamorro? (if time)

5. **Another duplication case**

- Many sign languages require that a content morpheme can have only one handshape (though within that handshape, fingers can open or close during the morpheme)
- When two roots are put together to form a compound word, there is often a rule that assimilates handshape
  - Hong Kong Sign Language example and images from Tang et al. 2010
    - Sign language from Hong Kong, related to Chinese Sign Language
    - endangeredlanguages.com estimates 9,000 users

  - TASTE handshape is
  - GOOD handshape is

  - TASTE^GOOD (meaning ‘tasty’) takes the TASTE handshape plus the ‘thumb-extended’ feature to get handshape (plus a closing movement): TASTE^GOOD

- In Estonian, a word-shape requirement prevents a rule from applying
- In Hong Kong Sign Language, a word-shape requirement causes a rule to apply
6. *Shortening a grammar*
- Using the brace notation to collapse \( \emptyset \rightarrow V / C \_ C\# \)
  \( \emptyset \rightarrow V / C \_ C\# \)
  into the shorter \( \emptyset \rightarrow V / C \_ C\{C,\#\} \) says that these rules have something significant in common.
  (Why? recall SPE’s evaluation metric...)

7. *Kisseberth 1970: cases where the notation doesn’t allow shortening*
- These rules have something in common too (what?), but they can’t be collapsed using curly brackets:
  \( \emptyset \rightarrow V / C \_ CC \)
  \( C \rightarrow \emptyset / CC \_ \)
- Cases of languages that have sets of rules like this are called *conspiracies*, and their widespread existence is the *conspiracy problem*.
  - (The difference between a case of the duplication problem and a case of the conspiracy problem is sometimes fuzzy and the terms are sometimes used interchangeably)

8. *Constraints*
- The \( \emptyset \rightarrow V \) and \( C \rightarrow \emptyset \) rules both seem to be applying to get rid of CCC sequences
- Moreover, there’s a rule that could be made simpler if we invoked a constraint \(*CCC\)
  - Kisseberth proposes…
    
    Instead of \( V \rightarrow \emptyset / V C \_ C \_ C \) [–long]
    use \( V \rightarrow \emptyset / C \_ C \_ C \) subject to the constraint \(*CCC\) (or \(*\{C,\#\}C\{C,\#\}\))

*If time, let’s try spelling out how some of this would work (otherwise, leave it for next time)...*

9. *Constraints as rule blockers*
- \( V \rightarrow \emptyset / C \_ C \), unless result would violate \(*CCC\)

  Let’s try to lay out, step by step, what an algorithm would have to do to implement the rule and its blocking constraint
10. **Constraints as rule triggers**

- Ø → i, only if needed to eliminate *CCC violation

❓ What exactly will happen, step by step?
11. Problems for triggering

❔ What happens if the grammar has a rule $\emptyset \rightarrow i$ (with no context) and a constraint *CCC?

$$/arbso/$$

❔ What happens if a grammar has rules $\emptyset \rightarrow i$ and $C \rightarrow \emptyset$ and a constraint *CC?

$$/eldu/$$

12. Where this leaves us

- Many more conspiracies were identified, giving rise to more constraints.
- People liked constraints, because they solved the conspiracy problem and also gave clearer theoretical status to the idea of “markedness”
  - Everyone knew languages don’t “like” CCC sequences (they are “marked”), but this was not directly encoded in grammars until constraints like *CCC came along.
- On the other hand, we’ll see that it’s unclear exactly how constraints should work.
  - Thursday we’ll wallow in this problem
  - Next week we’ll start trying to solve it
13. Final business

- 10 minutes for Malagasy—I want to talk about vowels
  - I also want to talk about exposition, but let’s leave that till next week
- “Muddiest point” exercise again: Let’s end today by again having everyone briefly type in the chat the issue or topic that was most unclear/puzzling/etc. to them today
- Kie: stop the recording!

References


