Phonology, part 7: Rule Types + Ordering

November 9, 2012
What’s the World Got in Store

• Today:
  • Some common phonological rules
  • Rule ordering

• And also: some more phonology practice exercises

• Wednesday after the long weekend: Phonology Homework will be due at the beginning of class.
  • Homework has been posted to the course web page.

• Starting next week: Syntax (grammar of sentences)
Them’s the rules!

• One common phonological process we’ve seen so far is **assimilation**.
  
  • = one sound becoming like another in its environment

• One distinction: total vs. partial assimilation

• Partial assimilation: only part (e.g., one feature) of the target sound changes.
  
  • English: /in-/ + /probable/ = **im**probable

• Total assimilation: the **entire** target sound changes to match another sound in its environment.
  
  • Arabic: /ʔal/ + /daːr/ = [ʔad daːr] “the house”
The Usual Suspects

- **Assimilation** processes can also affect sounds in different directions.

- **Regressive** assimilation: features spread backward in time.
  - Place assimilation in English: improbable

- **Progressive** assimilation: features spread forward in time.
  - Ex: voicing assimilation for English plural marker.
Insertion

• The phonetic shape of the plural marker in English also depends on another phonological rule...

• The following English plurals:
  matches \([mæt\text{ɪz}]\) judges \([dʒ\text{ʌd}z\text{ɪz}]\)
  hoses \([h\text{əwzɪz}]\) passes \([pæs\text{ɪz}]\)

• …and others like them exhibit an **insertion** rule.

• **Insertion**: nothing \(\rightarrow\) something / in some environment

• Specifically: \([i]\) insertion.
  • \(\emptyset \rightarrow [i] / [+\text{strident}] \_\_ [+\text{strident}]\)

• A fancy (shmancy) name for insertion is **epenthesis**.
Deletion

• **Deletion**: something → nothing / in some environment

• English example (casual speech):
  ‘fifth’ /fɪfθ/ → [fɪθ]

• English example (casual speech):
  ‘probably’ → [prablɪ]
  ‘suppose’ → [spowz]

• This also applies to /r/-dropping dialects…

• and the deletion of final consonants in Hawaiian Creole.
  • “paint” → [pen]
  • “old” → [ol]
Dissimilation

- **Dissimilation**: a change is made to a sound that makes it *less similar* to a sound in its environment.

- Example (from Greek):
  
  /epta/ → [efta] ‘seven’

  Rule: [-continuant] → [+continuant] / ____ [-continuant]

- Example (from English, casual speech):
  
  ‘sixth’ /sɪksθ/ → [sɪkst]


- These particular rules exhibit **manner dissimilation**.

- Dissimilation is relatively rare in the world’s languages.
Metathesis

• Metathesis: the order of two segments is changed.

• Example (Leti):

  /danat/ + /kviali/ → [dantakviali]

• Example (various English dialects):

  ‘ask’ → [æks]

• From kids’ speech:

  ‘spaghetti’ → [pəskɛri]

• From adults’ speech:

  ‘comfortable’ → [kʌmfərəbl]

• For some reason, metathesis seems to be more common in speech errors than in regular phonology.
Reduction

• Reduction: phonemic contrasts can be lost in particular phonetic environments.

• Ex: English **vowel reduction**.
  • vowels → [ə] / unstressed syllables
  • [kælɡæri] ~ [kælgɛriən]
  • [kænəɾə] ~ [kənɛjriən]

• Rule of thumb:
  • phonemic representations should include all of the **unpredictable** information about the sounds in a word form.

• Phonological rules account for the **predictable** phonetic information.
Terminology

• Since phonemic forms can sometimes not be seen directly, they are often referred to as *underlying representations*.

• In contrast, the phonetic forms are referred to as *surface representations*.
  • (we can see them directly)

• The process by which phonological rules convert phonemic forms to phonetic forms is called a *derivation*.

• The application of the rules can often take place in ordered steps.
  • (although sometimes the order doesn’t matter…)
Deep Thoughts

• Let’s say that the basic allophone for the plural marker is /z/.
  • it’s voiceless after [-voice] segments
  • an [ɪ] is inserted after [+strident] segments
  • it’s voiced [z] everywhere else
• Two rules have to apply to account for this pattern:
  • voicing assimilation
  • [ɪ] insertion
• The order of these rules matters. Which should go first?
The Wrong Way

• Here’s what can happen if we apply the voicing assimilation rule first, in forming the plural for ‘pass’.

  phonemic form: \( /pæs + z/ \)
  voicing assimilation: \( p^hæss \)
  [\(i\)] insertion: \( p^hæs\text{ɪ}s \)
  phonetic form: \( *[p^hæs\text{ɪ}s] \)

• This is wrong, because the phonemic \( /z/ \) has been devoiced in \([\text{ɪ}s]\).
The Right Way

• Here’s what happens if we apply the schwa insertion rule first, in forming the plural for ‘pass’.

  phonemic form:  /pæs + z /

  [ɪ] insertion:  pʰæsɪz

  voicing assimilation:  pʰæsɪz  (no change)

  phonetic form:  [pʰæsɪz]

• When the rules apply in this order, we get the appropriate phonetic form.

• Moral: when more than one phonological rule can apply, you must make sure they apply in the correct order.
Today’s Mysterious Quick Write

• We also know that phonology is going on underneath the surface because...
  
  • Sometimes, we see the results of rules even after the conditions for applying them have disappeared

• /t/ flapping in (North American) English

  “batter”       [bærər]
  “petal”        [pɛrl]
  “atom”         [ærm]

• Rule: /t/ becomes a **voiced** flap at the start of an unstressed syllable
More Evidence

• Flapping happens to /d/ in English, too.

• /d/ flapping in (North American) English
  “madder”  [mæərə]
  “medal”  [mɛəl]
  “ridden”  [rɪnd]

• /d/ becomes a (voiced) flap at the beginning of an unstressed syllable

• Sometimes, /t/ and /d/ can become indistinguishable:
  • “madder”  [mæərə]
  • “matter”  [mæərə]
Another Rule

• Remember Canadian Raising? It only occurs in certain environments:
  • “house” [hʌws] “loud” [lawd]
  • “write” [rʌjt] “ride” [rajd]
  • “pipe” [pʰʌjp] “bribe” [brajb]
  • “like” [lʌjk]

• [aj] and [aw] “raise” whenever they appear before a voiceless consonant.
True Patriot Sounds

• Canadian English is unique in that it has the following combination of phonological rules:

  • Flapping
    • alveolar stops becomes voiced flaps at the beginning of unstressed syllables

  • Raising
    • /aj/ → [ʌɪ] / ___ [-voice]
    • /aw/ → [ʌw] / ___ [-voice]

• It turns out there are cases where both rules might apply--
  • Ex: the word “writer”
  • In these cases, which one should apply first?
The Hidden Order

It turns out that both of these phonological rules can apply in a word like "writer". For words like this, does one of these rules have to apply first? If so, which one? Why do you think so?

On a related note, do you say "writer" the same way you say "rider"? (If you're not a native speaker of Canadian English, feel free to ask someone who is.)

I do pronounce "writer" like "rider", and I believe that you would have to change the vowels with the diphthongs before changing the consonants to voiced alveolar flaps, because if you did change the consonants first, it would become voiced and therefore you would not have to change the vowels.
The Right Way(s)

• “write” + “-er” = “writer”  (one who writes)
  phonemic form:  /rajt/ + /r/
  raising:  [rájtʃ]
  flapping:  [rájʃʃ]
  phonetic form:  [rájʃʃ]

• “ride” + “-er” = “rider”  (one who rides)
  phonemic form:  /rajd/ + /r/
  raising:  [rájdʒ]  (does not apply)
  flapping:  [rájʃʃ]
  phonetic form:  [rájʃʃ]
The Wrong Way

• “write” + “-er” = “writer”  (one who writes)

  phonemic level:  /rajt/ + /r/

  flapping [rájḱr]

  raising:  [rájḱr]  (does not apply)

  phonetic level:  * [rájḱr]

• The diphthong in “writer” is [ʌj], even though it is followed by a voiced sound

• ⇒ Raising had to apply before flapping

• Raising applied to units which don’t appear in the phonetic form!
By the way...

• The technical term for this phenomenon is **opacity**.
  • You **can’t see** the environment for a phonological rule
  • You can only see its results
• This is another example of structure in language that is not apparent on the surface...
  • remember “unlockable”?
  • = morphological ambiguity
• (Note: we’ll see it again)