Diachronic phonological analysis
LING 451/551
Winter 2011
Overview

- Parallels between synchronic, diachronic phonology
- Restructuring
- Reconstruction practice
Terminology and symbols

• Related forms
  – Synchronic
    • Alternants, allomorphs: Hungarian [kalap]~[kalab]
  – Diachronic
    • Cognates: Latin *ped* : English /fʊt/

• Sounds of related forms
  – Synchronic
    • Alternating segments: Hungarian [p]~[b]
  – Diachronic
    • Sound correspondences: Latin [p] : English [f]
Synchronic vs. diachronic analysis

• Kenstowicz 1994: 115
  – “Application of the Comparative Method involves discovering the sound correspondences between presumed cognate words and trying to assign a unique protoform...The entire procedure is similar in certain ways to the discovery of a word’s synchronic underlying representation on the basis of its phonetic alternants.”
Analysis

• Synchronic
  – URs + rules which describe underlying to surface (phonetic) forms
  – Underlying representation: Hungarian /kalap/

• Diachronic
  – Proto-forms + sound changes which describe Proto-language to daughter languages
  – Proto-form: Proto-Indo-European *ped/pod
Rules

• Synchronic
  – Phonological rule:
    Hungarian [-son] → [αvoiced] / ___ [-son, αvoiced]

• Diachronic
  – Sound change: PIE *p > Proto-Germanic *f
Rule types

• Synchronic
  – Neutralization
    • Hungarian [-sonorant] $\rightarrow$ [əvoiced] / ___ [-sonorant, əvoiced]
      – neutralizes difference between /p/, /b/; /t/, /d/ etc. before obstruents
  – Allophonic
    • English [-son, -cont, -vd] $\rightarrow$ [+spread glottis] / { ___ V
      [+stressed]
      #___ }
Rule types

• Diachronic rules
  – Merger
    • Early Modern English /ɒ/ (lot), /aː/ (palm) >
      American Eng. /ɑ/ (lot, palm)
  – Split: creates new sounds
    • Middle English /u/ > /ʊ/, /ʌ/ everywhere but
      in Northern England
    • N. England elsewhere
      – cud [kʊd] [kʌd]
      – could [kʊd] [kʊd]
      – putt [pʊt] [pʌt]
      – put [pʊt] [pʊt]
Rule types

- **Synchronic**
  - context-sensitive
    - / in rule
    - [-sonorant] \(\rightarrow\) [\(\alpha\)voiced] / ____ [-sonorant, \(\alpha\)voiced]
  - context-free
    - Turkish [+syllabic, -high, +back, -round] \(\rightarrow\) [+low]

- **Diachronic**
  - conditioned
    - “Later Yod Dropping”
      - American English /j/ \(>\) 0 / [+cor] ____
      - no [j]: tune, duke, new, enthusiasm, suit, presume, lewd
      - [j]: cute, argue, mute, beauty, puny, few, view, Hugh
  - unconditioned
    - PIE *p \(>\) Germanic *f
What is sound change really?

• Proto-Indo-European
  \[ *p > *f \]
• Proto-Germanic
• What really happened?
• Representations changed
  – scenario 1
    • maybe initially in some restricted context, e.g. #__; [p f]; /p/ \[\rightarrow [f] / #___; still /p/\]
    • maybe later everywhere except *s__; [f p], /f/ \[\rightarrow [p] / s__; /f/\]
    • maybe later everywhere; /f/ (Proto-Germanic)
  – scenario 2
    • maybe initially everywhere more conservative speakers’ [p]s produced as [f] by more innovative speakers; then /f/ for innovative speakers
Restructuring

• ‘A naïve and false conception of the relation of phonological rules and sound change is that the phonology of a language at any one time is simply the accumulation of the sound changes that have happened in the past. The reason this is not true is a phenomenon called restructuring.’ (Hayes, p. 224)

• ‘a major shift in a linguistic system induced by reinterpretation of the older generation’s output by a younger, language-acquiring generation.’ (Hayes, p. 226)
Sound change may be restructuring

- English (Hayes 224 ff.)
  - Common ancestor of Conservative and Innovating
    - no change
    - sound change: $\textlt{} \rightarrow \textw$
    - Conservative
    - Innovating

- Differences between 3 varieties
  - Common ancestor of Conservative and Innovating
    - *which* [ʍɪʧ], *witch* [wɪʧ]: /w/, /ʍ/
  - Conservative American English
    - *which* [ʍɪʧ], *witch* [wɪʧ]: /w/, /ʍ/
  - Innovating American English, "ʍ > w"
    - [wɪʧ] for both: /w/
The modern systems in more detail

- ‘Older speakers’ = Conservative
- ‘Younger speakers’ = Innovating

Older Speakers

two phonemes, /w/ and /ʍ /
Phonological rule of /ʍ/ Voicing: ʍ → [+voice] in all but careful speech

Younger Speakers

one phoneme: /w/
no /ʍ/ Voicing rule
Restructuring

• Common Ancestor presumably similar to Conservative
  – /w/, /ʍ/; ʍ Voicing
  – careful speech [w]~[ʍ]
  – casual speech [w]
• Younger speakers reinterpret as [w] (= /w/)
Another case of restructuring

(70) a. \[ V \rightarrow \emptyset / \_\_\_ \; # \]
    \[ G1 \rightarrow \emptyset / C \_\_\_ \; # \]
    \[ [\text{we}] \rightarrow [o] \]
    \[ [o] \rightarrow [i] \]
    \[ [e] \rightarrow [i] / \# \_\_\_ \]
    \[ [m,n] \rightarrow \emptyset / \_\_\_ \; # \]
    \[ V \rightarrow \emptyset / \_\_\_ \; # \]
    \[ [m] \rightarrow [b] \]
    \[ [s] \rightarrow [h] \]
    \[ [h] \rightarrow \emptyset / \_\_\_ \; # \]

b. *meto:ni ‘mouth’  
    *eleniwa ‘man’ 
    meto:n  
    eneniw  
    meti:n  
    eneni  
    meti:  
    ineni  
    beti:  
    inen

Proto-Algonquian to Arapaho sound changes.

Development of Proto-Algonquian in Arapaho.  
Presumably every stage involves restructuring.
*aθemwa 'dog'
aθemw
aθem
eθem
eθe
eθ

*mo:swa 'moose'
mo:sw
mo:s
mi:s
mi:h
bii

V → Ø / ___ #
Gl → Ø / C ___ #

*maxkeseni 'moccasin'
maxkesen
maʔkesen
maʔesen
moʔesen
moʔoson
moʔohon
woʔohon
woʔoho
woʔoh

(cf. F mahkes-ehi, C maskisin, M mahkesin, O mahkisin)
‘Restructuring’ of rule system

• ‘Rule inversion’
• Earlier stage
  /a/ → [b] / X ___ Y
• Later stage
  /b/ → [a] / ~X____~Y (not always exact complement of X, Y)
English r-loss and intrusive r

- Non-rhotic dialects of English

- *robin* [ˈrɒbən], *bar* [bɑː:], *bird* [bɜːd]
  - r-loss: /r/ → 0 / __{C, #}
  - alternations: *star* [stɑː:], *starry* [stɑːːri] (/r/ still in UR)
  - restructuring of *bar* and *bird*

- r-insertion ("intrusive r") (later than r-loss, inverted)
  - ‘a process which automatically inserts an ‘r’ between two words if the first vowel ends in …[ɑː], …[ɔː], … [ɪə] or …[ɛ], and the second word begins with a vowel’
  - *Obama* [əˈbaːmə], *Obama is* [əˈbaːmərɪz]
  - 0 → [r] / V ___ V
    - high
    - back
    - tense
Reconstruction

- Balto-Finnic languages. [ä] = [æ]; Estonian [d g] = voiceless unaspirated

<table>
<thead>
<tr>
<th>Livonian</th>
<th>Finnish</th>
<th>Estonian</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. säv</td>
<td>savi</td>
<td>savi</td>
</tr>
<tr>
<td>b. tämm</td>
<td>tammi</td>
<td>tamm</td>
</tr>
<tr>
<td>c. säpp</td>
<td>sappi</td>
<td>sapp</td>
</tr>
<tr>
<td>d. lüm</td>
<td>lumi</td>
<td>lumi</td>
</tr>
<tr>
<td>e. sül</td>
<td>süli</td>
<td>süli</td>
</tr>
<tr>
<td>f. töb</td>
<td>topi</td>
<td>tobi</td>
</tr>
<tr>
<td>g. ä:rga</td>
<td>härkä</td>
<td>härg</td>
</tr>
</tbody>
</table>

- What was the form of the common ancestor? How did the languages develop from the common ancestor?
Some vowel correspondences

- ä : a : a
  - L säv : F savi : E savi
- ü : u : u
  - L lüm : F lumi : E lumi
- ö : o : o
  - L töb : F topi : E tobi
- ä : ä : ä
  - L ä:rga : F härka : E härg
- Kenstowicz: ‘it is reasonable to suppose that Livonian [ä] and [ü] in [a-d] [and ö in f.] derive from earlier back vowels via a process of vowel fronting (umlaut) caused by a no longer pronounced front vowel [in Livonian].’
  - why reasonable? F, E don’t do this
- Re Livonian: ‘these rules must have applied in the order indicated at some earlier stage of the language and perhaps reflect a corresponding chronology’

  umlaut \quad V \rightarrow [-\text{back}] / ____ C_0 [i]
  apocope \quad [i] \rightarrow \emptyset / ____ #
More vowel correspondences

- 0 : i : 0
  - L tämm : F tammi : E tamm
  - L säpp : F sappi : E sapp

- 0 : i : i
  - L säv : F savi : E savi
  - L lüm : F lumi : E lumi
  - L sül : F suli : E suli
  - L töb : F topi : E tobi

- a : a : 0
  - L ä:rga : F härka : E härg

- in Estonian there is ‘a more general apocope process that has deleted final vowels…It is regularly suspended in words of the shape CVCV.’
  - constraint against making words “too short”
More data

- $[V:] = [VV]$

<table>
<thead>
<tr>
<th>Livonian</th>
<th>Finnish</th>
<th>Estonian</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ko:r</td>
<td>kaari</td>
<td>kaar</td>
<td>‘rib’</td>
</tr>
<tr>
<td>b. mo:</td>
<td>maa</td>
<td>maa</td>
<td>‘land’</td>
</tr>
<tr>
<td>c. o:da</td>
<td>hauta</td>
<td>haud</td>
<td>‘grave’</td>
</tr>
<tr>
<td>d. so:na</td>
<td>sauna</td>
<td>saun</td>
<td>‘sauna’</td>
</tr>
<tr>
<td>e. ja:lga</td>
<td>jalka</td>
<td>jalg</td>
<td>‘foot’</td>
</tr>
<tr>
<td>f. suormød</td>
<td>sormet</td>
<td>sormed</td>
<td>‘finger’</td>
</tr>
<tr>
<td>g. vierda</td>
<td>verta</td>
<td>Verd</td>
<td>‘blood’</td>
</tr>
<tr>
<td>h. o:r’a</td>
<td>harja</td>
<td>hari</td>
<td>‘sandbank’</td>
</tr>
</tbody>
</table>
More vowel correspondences

- ‘The simplest hypothesis is that [F and E are conservative and] Livonian has two separate sound changes: *a: > o: and *au > o::’
Consonant correspondences

- L0 : F h : E h
  - Lo:da : F hauta : E hau d

- ‘The most plausible analysis postulates a rule deleting *h in Livonian. The alternative would be a prothesis rule inserting [h] in the historical development of Finnish and Estonian.’
  - Presumably more plausible to posit one sound change (for one language) rather than 2 identical changes in 2 other lgs.
  - But more data would be nice
    - ‘The first analysis would be supported by vowel-initial cognates in Finnish and Estonian...’
Long/short vowel correspondences

- L [aː] : F [a] : E [a]
- L [oː] : F [a] : E [a]
Long/short vowel correspondences

- Kenstowicz posits for Livonian
  \[ V \rightarrow V: / ____ \text{ liquid } \{C, #\} \]

- L [sül] ‘womb’: F, E [süli]
  - ‘suggests that [Lengthening] precedes the loss of final vowels; at the point where apocope applies, the form is *süli and hence lacks a closed syllable.’
Livonian diphthongs

• ‘Livonian diphthongization of [long?] mid vowels’

• More data
  – L [suo] ‘marsh’ : F [soo]
  – L [miez] ‘man’ : F [mees]
Livonian [r’]

- L [r’] : F [rj] : E [r]
  - [o:r’a] : [harja] : [hari]

- ‘the palatalized consonant of Livonian [o:r’a] reflects an original palatal glide (preserved in Finnish) that has merged with the liquid, presumably after vowel lengthening.’

- ‘In Estonian the glide has vocalized to [i] after apocope’
Final analysis

• Reconstructions + sound changes


Livonian
V $\rightarrow$ [−back] / ___ C₀ [i]
[i] $\rightarrow$ Ø / ___ #
[h] $\rightarrow$ Ø, [a:] $\rightarrow$ [o:], [au] $\rightarrow$ [o:]
V $\rightarrow$ V: / ___ [l,r]
[o:] $\rightarrow$ [uo], [e:] $\rightarrow$ [ie]

Estonian
V $\rightarrow$ Ø / ___ #
[j] $\rightarrow$ [i] / C ___ #
apocope precedes glide vocalization

umlaut precedes apocope
liquid lengthening precedes
diphthongization and apocope
diphthongization precedes [a:] $\rightarrow$ [o:]
Showing developments of proto-forms in daughter languages

• Check analysis for unaccounted for details
• Proto-Balto-Finnic to Livonian

• *savi *lumi *topi *süli
  > (umlaut) sävi lümi *töpi (vacuous)
  > (i-apocope) säv lüm töb *sül

• *tammi *sappi
  > (umlaut) tämmi säppi
  > (i-apocope) tämm säpp
•  *härka    *hauta
  > (h-del)  ärka    auta
  > (au monoph)  oota
  >  ärqa    ooda
Diachronic phonology summary

• Many parallels with synchronic analysis
• But more complex
  – first requires synchronic analysis of more than one system