Phonological typology

LING 451/551
Winter 2011
Overview

- Typology, phonological typology
- Phoneme inventory typology
- Phonological rule typology
Phonological typology

• What kinds of phoneme inventories are found?
• What kinds of sound classes?
• What kinds of phonological operations?
• Which are common? uncommon
  • Odden 2005: ‘It is very difficult to refute a claim of the form ‘X is more common than Y,’ except if a very detailed numerical study is undertaken.’ (p. 227)
• Most research on spoken languages; but see Rozelle (2003) for signed languages
Why learn about phonological typology

• Aid to analyzing phonological data
  – I’ve seen this before…
  – Typically it goes like this…

• Aid to understanding current theories of phonology (452)
Markedness

- Odden: ‘not all segments or sets of segments have equal status in phonological systems’ (p. 226)
- ‘Marked’ = uncommon, learned late as L1
- ‘X is marked’ (relative to Y)
  - “[ʕ] is more marked than [q]”
  - “[q] is more marked than [k]”
  - “pharyngeals are marked sounds” (relative to other sounds of the world’s languages)
Types of phoneme inventories

- Consonant and vowel phonemes; excluded stress, tone
## Stanford Phonology Archive vs. UPSID

- Previous to UPSID, Stanford Phonology Archive (Vihman 1974)

<table>
<thead>
<tr>
<th></th>
<th>SPA</th>
<th>UPSID</th>
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</thead>
<tbody>
<tr>
<td># of languages</td>
<td>196</td>
<td>317</td>
</tr>
<tr>
<td>criterion for lg</td>
<td># of speakers</td>
<td>quota sample</td>
</tr>
<tr>
<td>selection</td>
<td></td>
<td>(lg family based)</td>
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<tr>
<td>scope</td>
<td>phonological descriptions</td>
<td>phoneme inventories</td>
</tr>
<tr>
<td>relation to sources</td>
<td>strictly followed source</td>
<td>interpreted to ensure consistency</td>
</tr>
<tr>
<td>grammar</td>
<td>grammar</td>
<td>in UPSID</td>
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</table>
Language sampling in UPSID

• ‘the selected languages represent in proper proportion the internal genetic diversity of various groupings...Similarities between languages in the sample are therefore not due solely to the effect of shared historical origin.’ (p. 158)

• How: ‘Intermediate levels of classification were...sampled...The density of this sampling might be thought of as representing an intention to include no pair of languages which had not developed within their own independent speech communities for at least some 1000-1500 years’
Reinterpretation of sources

• Transcriptional
  – Slavic palatalization: /Cj/ transcribed /C’/
  – Athabaskan: /t th t’/ transcribed /d t t’/
  – Bantu: /p’ t’ k’/ often transcribed /p t k/ (vs. /p^h t^h k^h/)

• Analytical
  – “Suspect” complex phonetic events, such as affricates, geminated consonants, prenasalized stops, etc., and diphthongs’ (p. 161): one sound or two?
  – Marginal segments
    • Excluded: those in interjections, ‘foreign words that are not clearly established as loans’
    • Included: if ‘the loans appear to be fully assimilated in the language concerned’ (p. 162)

• Length
  • ‘It has been treated as suprasegmental if it applies to a whole class of segments, such as all vowels. Otherwise it is treated as a segmental property.’ (p. 162)
<table>
<thead>
<tr>
<th>Language</th>
<th>bilabial</th>
<th>labio-dental</th>
<th>dental</th>
<th>alveolar</th>
<th>palato-alveolar</th>
<th>palatal</th>
<th>velar</th>
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<tr>
<td>Spanish (0ll)</td>
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<tr>
<td>voiceless plosive</td>
<td>p</td>
<td></td>
<td>t</td>
<td></td>
<td></td>
<td>k</td>
<td></td>
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<tr>
<td>vl. sibilant affricate</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>tʃ</td>
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<tr>
<td>vl. nonsibilant fricative</td>
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<td></td>
<td>f</td>
<td>θ</td>
<td></td>
<td>x</td>
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<tr>
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<td></td>
<td>β</td>
<td>δ</td>
<td></td>
<td>γ</td>
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<tr>
<td>voiced nasal</td>
<td>m</td>
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<td>n</td>
<td></td>
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<td>p</td>
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<tr>
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<td>r</td>
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<tr>
<td>voiced tap</td>
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<td>d</td>
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<tr>
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<td></td>
<td>l</td>
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<td>ι</td>
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<tr>
<td>vd. central approximant</td>
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<td>j</td>
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<td>w</td>
</tr>
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</table>

| Vowels                 |           |           |       |           |       |       |           |       |
| high                   | i          | u          |       |           |       |       |           |       |
| mid                    | "e"       | "o"        |       |           |       |       |           |       |
| low                    | a          |            |       |           |       |       |           |       |
Results for consonants

• ‘>’ = is more common than
• Place of articulation
  – labial, alveolar, velar > alveopalatal > uvular, dental, retroflex > pharyngeal
• Most languages have one laryngeal consonant
  – /h/ > /ʔ/ > /ɦ/
Manner of articulation

- Stops > fricatives, nasals
- Most languages have at least one fricative
  - Klamath: /s/ only
- Most languages have one liquid
- Most languages have glides /w j/
  - but in some languages, /w j/ do not contrast with high vowels
• Most languages have at least one nasal
• Some N. American lgs lack nasals
  – Pawnee and Wichita (Caddoan)
  – PNW “nasalless” languages (Thompson and Thompson 1972)
    • Quileute (Chimakuan)
    • Lushootseed and Twana (Salish)
    • Makah and Nitinat (Wakashan)
    • In Nitinat and Makah [m n] are ‘only in forms that are clearly borrowings from neighboring languages with nasals or are otherwise marginal’ (p. 443).
  • In Lushootseed and Twana, a few ‘marginal’ or ‘special’ forms are found with nasals (‘small’ and diminutives; 1 place name in Lushootseed; in myths, ritual sayings, prayers, and songs, certain characters regularly replace voiced stops with nasals)
• UPSID lists Lushootseed, Quileute w/o nasals
Phonation contrasts

- **Obstruents**
  - **Stops**
    - voiceless (aspirated) only
    > voiceless vs. voiced
    > voiceless vs. aspirated
    - uncommon: ejectives, implosives, breathy voicing, laryngealization
  - **Fricatives**
    - voiceless > voiced
    - uncommon: ejective or aspirated fricatives, breathy voiced fricatives

- **Sonorants:** laryngeal contrasts rare
Results for vowels

• /i e a o u/ > /i a u/
• front rounded vowels > back unrounded vowels
• inventory like English is unusual
Phonological rule typology

• A more complex problem than segment inventory typology, requires more language-particular commentary and analysis

• Inventory typology
  – Every spoken language has consonants and vowels
  – No shortage of data; sampling procedure needed

• Rule typology
  – All spoken languages have phonological rules, but rules of interest not found in every language
  – may be in certain language families but not others
    • rounding harmony common in Turkic languages

• Markedness of sound classes and operations much less clear than markedness in segment inventories
Assimilation/dissimilation vocabulary

- Undergoer (focus of rule)
- Trigger (element of context)
- Type of change (element of structural change added to focus)

Rounding harmony in Yawelmani

\[(4) \begin{bmatrix} V \\ \alpha hi \end{bmatrix} \rightarrow \begin{bmatrix} + \text{round} \end{bmatrix} / \begin{bmatrix} V \\ \alpha hi \\ + \text{round} \end{bmatrix} C_{o-} \]
Types of assimilation rules

• Phonetic origins in coarticulation
• Vowel assimilation
  – Vowels undergo, vowels or consonants may trigger
    ➢ Triggering vowels and undergoing vowels need not be adjacent
• Consonant assimilation
  – Consonants undergo, consonants or vowels may trigger
    ➢ Triggering segment typically adjacent to undergoing consonant
Vowel assimilation

• Vowel harmony
  – non-adjacent focus, trigger; iterating
  – Front-back (Turkish, Hungarian)
  – Height (N. Salentino)
  – ATR (Akan, Okpe)
  – Rounding (Turkish)
Some variations on Rounding Harmony

- Kirghiz
  - all vowels assimilate in rounding to preceding vowels except that [a] does not assimilate to [u]
- Turkish
  - only high vowels undergo, all round vowels trigger
- Sakha (Yakut)
  - high vowels undergo, round vowels trigger; nonhigh vowels undergo if same height as trigger
- Mongolian
  - only nonhigh vowels undergo, only nonhigh vowels trigger
- Yawelmani
  - vowels undergo if same height as trigger
Phonological typology summary

• Comparison of phonological systems
  – segment inventories
  – phonological rules and classes of sounds

• Methods for studying inventories differ from methods for studying rule systems

• Large-scale results
  – Sound patterns are simple and symmetrical
  – (Within inventories) some phonological structures more common (‘less marked’) than others