Phonology

Part II: Phonological processes in synchrony and diachrony

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Phonological processes

- Assimilation
- Dissimilation
- Epenthesis
- Deletion
- Lengthening
- Shortening
- Metathesis
- Neutralization
Assimilation

Parameters

- phonetic properties that are assimilated
  - partial assimilation
  - total assimilation
- direction of the assimilation
  - progressive
  - regressive
- sounds that are assimilated
- sounds that trigger an assimilation
Assimilation

Parameters (cont’d)

- further distinction:
  - long-distance assimilation
  - assimilation of adjacent sounds

Example: Luganda (Katamba 1989)

- mbala ‘I count’
- ntema ‘I cut’
- mpa ‘I give’
- ηagala ‘I like’
- mmala ‘I finish’
- ηnumja ‘I converse’
- ndaga ‘I show’
- ηcoppa ‘I become destitute’
- nsika ‘I pull’
- ηkola ‘I work’
- nneηa ‘I blame’
- ηgula ‘I buy’
Dissimilation

- parameters are the same as for assimilation
- example: Kirundi (Katamba 1989)

<table>
<thead>
<tr>
<th>Imperative</th>
<th>1st pers. PL present</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>rja</td>
<td>turja</td>
<td>‘eat’</td>
</tr>
<tr>
<td>mwa</td>
<td>tumwa</td>
<td>‘shave’</td>
</tr>
<tr>
<td>bona</td>
<td>tubona</td>
<td>‘see’</td>
</tr>
<tr>
<td>soma</td>
<td>dusoma</td>
<td>‘read’</td>
</tr>
<tr>
<td>seka</td>
<td>duseka</td>
<td>‘laugh’</td>
</tr>
<tr>
<td>kubita</td>
<td>dukubita</td>
<td>‘hit’</td>
</tr>
</tbody>
</table>

- motivations for dissimilation?
Epenthesis

- addition of one or more sounds to a word
- motivations:
  - ease of pronunciation
  - creation of simpler syllables
  - to fulfill word property constraints
- example: English: /z/ ‘PL’
  /bæg-z/ [bægz] ‘bags’
  /hæt-z/ [hæts] ‘hats’
  /feis-z/ [feis-ɪz] ‘faces’
  /feiz-z/ [feiz-ɪz] ‘phases’
  /dɪʃ-z/ [dɪʃ-ɪz] ‘dishes’
  /biːtʃ-z/ [biːtʃɪz] ‘beaches’
Deletion

- **syncope**: deletion of a word-internal vowel
  \[CV.CV.CV > CVC.CVC\]
- **apocope**: deletion of a word-final vowel
  \[CV.CV > CVC\]
- other types of deletion
- **diachronic development**:
  - shortening of unstressed vowels
  - shortening of consonants
  - assimilation of consonants
Lengthening and shortening

- often dependent on stress and/or syllable:
  - vowels of stressed syllables tend to be lengthened
  - vowels of unstressed syllables tend to be shortened
  - vowels of open syllables can be lengthened or shortened
  - vowels of closed syllables tend to be shortened

- further diachronic development:
  - deletion of shortened sounds
  - longer life for longer sounds
Metathesis

- re-arranging of sounds or syllables
- often involves the switching of two or more adjacent sounds
- however, the involved sounds do not have to be adjacent
- motivations for metatheses
  - ease of pronunciation
  - to obtain better syllables or syllable boundaries
- examples:
  - English: *ask* > *aks*, *relevant* > *revelant*, *nuclear* > *nucular*
  - French verlan: *métro* > *tromé*, *français* > *céfran*
Neutralization

- contrast not available in a particular environment
- often involves syllable codas
- example: only voiceless (but not voiced) obstruents after syllable-initial /s/ in English (/sp st sk/ are OK, but */sb sd sg/ are not OK)
- another example: noun class prefixes in Luganda only allow /i a u/, other syllables also allow /e o/, e.g.
  - mu-sota, mi-sota ‘snake(s)’ ki-ntu, ßi-ntu ‘thing(s)’
  - mu-ntu, ßa-ntu ‘person(s)’ ka-tale, ßu-tale ‘market(s)’
Some theoretical approaches

Phonological processes in synchrony
- Derivational Phonology (> seventies)
- Optimality Theory (> Prince & Smolensky 1993)

Phonological processes in diachrony
- Evolutionary Phonology (> Blevins 2004)
Derivational Phonology

- surface forms (phonetic forms) are derived from underlying forms through rules
- example: palatalization in Kinyarwanda
  - rule: the velar stops/kɡ/ are realized as the palatal stops [c ɟ] before the front vowels /e i/
  - or more formal: [-son, +back] → [-back] / ___ [-cons, -back]

Underlying representation /gukata/ /kugenda/ /umugi/

----- /kuɿenda/ /umugi/

Surface representation [gukata] [kuɿenda] [umugi]
Derivational Phonology

- rules can interact with each other
- example: Luganda (Katamba 1989)
  - rule A: glide formation: the high vowels /i u/ become the nonsyllabic glides /j w/ when they are followed by other vowels:
    
    /mu-ojo/ → [mwojo] ‘soul’  
    /li-anda/ → [ljanda] ‘coal’
  - rule B: root-initial /j/ can optionally be deleted in some contexts:
    
    /tu-jagala/ → [twa:gala] ‘we like’
  - rule B creates the context for the application of rule A: feeding
- rule orders:
  - feeding: R1 triggers R2
  - bleeding: R1 blocks R2
  - counterfeeding: R1 can trigger R2, but R2 has to be applied before R1
  - counterbleeding: R1 can block R2, but R2 has to be applied before R1
Optimality Theory

Principles
- Two layers of representation (as in generative phonology), called input and output representation
- Phonological generalizations are not expressed through rules but rather through so-called constraints
- The constraints are universally valid
- The grammars of the world’s languages are characterized by tendencies which are in conflict with each other. These tendencies can be expressed through the constraints
- The constraints are ranked language-specifically
- Constraints can be violated, but the violation has to be minimal
Optimality Theory

Components of the OT grammar (Kager 2004:19)

- **Lexicon**: contains lexical representations (or underlying forms) of morphemes, which can be the input to:

- **Generator (Gen)**: generates output candidates for some input, and submits these to:

- **Evaluator (Eval)**: the set of ranked constraints, which evaluates output candidates as to their harmonic values, and selects the optimal candidate
## Optimality Theory

### Tableau representation

<table>
<thead>
<tr>
<th>/Input/</th>
<th>CONSTRAINT 1</th>
<th>CONSTRAINT 2</th>
<th>CONSTRAINT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Candidate a]</td>
<td>*!</td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>[Candidate b]</td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

- **Optimal candidate**
- * Constraint violated
- ** Constraint violated twice
- ! Violation fatal
- [shaded] Violation can be neglected since the optimal candidate is already evaluated
- [dashed] Constraints unranked
Optimality Theory

Example: syllable structure in Luganda (McCarthy 2003)

Vowels are always long before prenasalized consonants: compensatory lengthening after nasal leaves the coda and joins the following syllable

<table>
<thead>
<tr>
<th>/muntu/</th>
<th>NO-CODA</th>
<th>MAX</th>
<th>UNIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>![a. [muː^n tu]]</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>![b. [mun.tu]]</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>![c. [muː.tu]]</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

**NO-CODA:** coda not permitted

**MAX:** no deletion

**UNIF:** UNIFORMITY (faithfulness constraint against coalescence)
Evolutionary Phonology

Aim: explanation of typological distributions of sound patterns (Blevins 2006)

- Why are certain sound patterns extremely common, while others are rare?
- What factors play a role in determining similar sound patterns across languages?
- What is the ultimate explanation for the striking similarity between recurrent context-dependent instances of sound change and recurrent alternation types across the world’s languages?
Evolutionary Phonology

Premises

- Diachronic explanations of sound changes have priority over synchronic explanations
- Extra-phonological explanations of sound changes have priority over competing phonological explanations (distinguishes Evolutionary Phonology from Generative Phonology and Optimality Theory)
Evolutionary Phonology

Hypotheses (supported by empirical studies)

- A common sound pattern is usually the result of a common phonetically motivated sound change
- A rare sound pattern is not the result of a common phonetically motivated sound change
- Diachronic explanations for synchronic properties of certain sound patterns are better than synchronic explanations
- Sound change is not teleological (goal-oriented)
- A rare sound pattern can be rare due to sound change or due to an accidental gap
Evolutionary Phonology

Potential sources of similarity in sound patterns (Blevins 2007)
- direct inheritance
- indirect inheritance (contact, prescriptive norms, literacy)
- phonetic factors (articulatory, aerodynamic, perceptual)
- language-specific factors (lexical, structural, self-organizing)
- cognitive factors (including potential linguistic universals)
- chance
Evolutionary Phonology

Model of sound change: 3 types (Blevins 2004)

- **Change**: The phonetic signal is misheard by the listener due to perceptual similarities of the actual utterance with the perceived utterance

- **Chance**: The phonetic signal is accurately perceived by the listener but is intrinsically phonologically ambiguous, and the listener associates a phonological form with the utterance which differs from the phonological form in the speaker’s grammar

- **Choice**: Multiple phonetic signals representing variants of a single phonological form are accurately perceived by the listener, and due to this variation, the listener acquires a prototype or best exemplar of a phonetic category which differs from the phonological form in the speaker’s grammar
Thank you!