Advanced Phonetics and Phonology

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Lecture (7)

NATURALNESS AND STRENGTH
Naturalness

Natural

Reasonable or expected in a particular situation (*Macmillan English Dictionary*)

“to be expected”, “frequently” found across languages”.

In phonology:

The probability that particular sounds, classes of sounds, or phonological rules to occur in any language.
Naturalness

Natural:
What sounds or patterns that appear:
* commonly across languages
* as the implied thing in universals
* earlier in child language development
* more stable in disordered speech
* in pidgins and creoles

When these criteria all line up, we say these sounds/patterns are UNMARKED
The features that recur again and again are said to be unmarked or natural. The examples below are infrequent in English, hence unnatural.

- Voiceless sonorants
- Voiceless approximants
- Velaric airstream
- Front rounded vowels
- Nasalized vowels
Naturalness

UNMARKED

What inventories are common?

Place of Articulation

- labial, alveolar, velar
- … then alveo-palatal
- … then uvulars, dentals, retroflex,
- … then pharyngeals

Secondary Place of Articulation: velar rounding, palatalization

- So: among places of articulation, labial, coronal and velar are unmarked
Naturalness

UNMARKED

- What inventories are common?

Manner

- stops, fricatives,
- ... and one nasal...
- ... and one r, l, glides w, j
- ... affricates
Naturalness

UNMARKED

- What inventories are common?

Manner

Obstruents voicing:

- voiceless (asp. or not)
- plain voiced
- plain voiced ~ asp. voiceless
- ... then ejective, implosive, breathy

Sonoronats voicing: voiced... then voiceless
Naturalness

UNMARKED

- What inventories are common?

Vowels

- Vowels: \( i, u, e, o, a \) … then other ones
- V-rounding: \( i, u \) … then \( y, u \)
- V-height: \( i, u \) … then \( e, o \)
- V-height: \( i, u \) … then \( e, o \)
- V-nasality: oral … then nasal
- V-voice: modal … breathy, creaky
Natural Phonology

A theory of phonology developed by David Stampe and others in the 1970s.

NP makes ‘rule naturalness’ its prime theoretical consideration, distinguishing between natural processes and learned processes.
Natural Phonology

basic thesis was that phonological systems are *phonetically motivated*

A system of subconscious mental processes:
- fortition, lenition
- devoicing / voicing,
- patalisation,
- assimilation,
- nasalisation
A phonological process is a mental operation that applies in speech to substitute, for a class of sounds or sound sequences presenting a specific common difficulty to the speech capacity of the individual, an alternative class identical but lacking the difficult property.

A set of universal, obligatory, inviolable processes which govern the phonology of a language. They are said to be ‘natural’ because they are phonetically plausible, as evidenced by their tendency to appear similarly in a wide range of languages (Crystal, 2008).
Natural Phonology

universal processes of phonology that are motivated by:

- the physiology of the speech organs
- the acoustic characteristics of speech sounds.
Natural Phonology

natural responses of the human vocal and perceptual systems to the difficulties encountered in the production and perception of speech;

e.g., it is more difficult to:

- on aerodynamic grounds, produce a voiced stop than a voiceless one
- a voiced velar stop than an alveolar one (a bilabial one is the easiest)
- it is easier to perceive lower than higher vowels due to the greater perceptual salience of the former
Natural Phonology

phonetically motivated

universal: a child learns to inhibit some of those natural responses in order to arrive at a language-specific phonology tension between two conflicting criteria: *ease of production* vs. *clarity of perception*
Natural Phonology

processes perform substitutions in order to adapt the speaker's phonological intentions to his/her phonetic capacities as well as enable the listener to decode the intentions from the flow of speech
Processes vs. Rules

- morphonological rules do not have any synchronic phonetic motivation and have to be learned

- morphonological processes have universal (phonetic) motivation and are subconsciously acquired
# Processes vs. Rules

<table>
<thead>
<tr>
<th>Processes</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>synchronic phonetic motivation</td>
<td>semantic, grammatical function</td>
</tr>
<tr>
<td>innate</td>
<td>learned</td>
</tr>
<tr>
<td>apply unconsciously</td>
<td>formed through observation</td>
</tr>
<tr>
<td>exceptionless</td>
<td>tolerate exceptions</td>
</tr>
<tr>
<td>apply to slips, Pig Latins, foreign words</td>
<td>do not</td>
</tr>
<tr>
<td>obligatory or optional</td>
<td>obligatory (conventional, style-independent)</td>
</tr>
</tbody>
</table>
Processes Account for:

- normal performance
- child language
- second language acquisition
- aphasia and other types of disorders
- casual speech, emphatic speech
- slips, errors, language games
- whispered and silent speech
- sound change
- implicational universals by substituting the implying sound by the implied one (e.g. Fricative \(\rightarrow\) stop)
Processes Account for:

- naturally pronounceable in Natural Phonology means derivable by means of phonological processes

- the task of Natural Phonology is a constant search for processes in the languages of the world
Application on Natural Phonology

- The speech of very young children is clearly different in certain respects from that of adults speaking the same language.

- Natural phonology assumes that children’s speech is governed by a large number of *natural phonetic constraints*, whereas adults have learned *to suspend many of these constraints* and thereby enjoy the benefits of a more complex phonological system.
In each language, mature speakers have learned to suspend certain constraints, but leave others unaffected.

The set of unaffected constraints varies from one language to another; this often has striking effects when a word is borrowed from one language into another.
Natural phonologists have used the term ‘process’ to refer to a natural phonetic constraint, i.e., a constraint which simplifies articulation.

Processes are typical of young children’s speech. The following are examples of processes:

- (a) Consonant clusters are reduced to single segments (fly [flai] becomes [fai]).
- (b) Unstressed syllables are deleted (potato [pʰ teitou] becomes [‘teitu]).
(c) Voiced stops (e.g., [b], [d]) are made voiceless ([p], [t]) since the airflow required by voicing is interrupted by the fact of complete closure of the oral tract.

(d) Consonants produced with the tongue body (e.g., [k], [g]) become articulated with the tongue blade ([t], [d] respectively).
Application on Natural Phonology

- three types of process have been distinguished:
  - (a) **Prosodic**: mapping words, phrases and sentences onto basic rhythm and intonation patterns.
  
  - (b) **Fortition**: strengthening a sound (e.g. devoicing of obstruents), intensifying the contrast of a sound with a neighboring sound (dissimilation), adjusting the timing of movements so as to have the effect of inserting a new sound (*sense* /sɛns/ → [sɛ̃nts]).
(c) **Lenition**: weakening a sound (e.g., making a stop into a fricative between vowels), decreasing the contrast of a sound with a neighboring sound (assimilation, harmony), adjusting the timing of movements so as to have the effect of deleting a sound (*cents* /sɛnts/→[sẽɪns]) or of making a nonsyllabic consonant syllabic (*parade* /pəreɪd/→ [pɾɛɪd]).
Application on Natural Phonology

It is claimed that fortitions are aimed at increasing intelligibility for the hearer, but that they often have the concomitant effect of easing pronounciability; lenitions, on the other hand, have this latter effect as their exclusive goal.

The effect of fortitions becomes salient in slower, more formal speech styles, while lenitions are more likely to operate in faster, more colloquial styles.
Some processes may govern phonological alternations. For example, in German the word meaning ‘dog’ is pronounced /hʊnd/ when followed by a suffix beginning with a vowel; when /hʊnd/ is followed by plural suffix [a]; in the nominative singular, however, where there is no suffix, one has /hʊnt/; this [d]-[t] alternation is brought about by the devoicing process (c) above, which remains operative word-finally in German.
However, not all alternations arise from the operation of processes.

Thus, in English, when *electric* takes the suffixity, its final /k/ becomes /s/ (‘velar softening’) when *serene* /sɪˈriːn/ takes the suffixity in *serenity* /sɪˈrɛnɪti/ the long [iː] becomes short [ɪ] (‘trisyllabic laxing’).

The principles governing these alternations are called ‘rules’ in the theory.
Processes and Rules

Rules typically operate in selective fashion (not all /k/ phonemes become /s/ when followed by written i or e (kit, keep),

Rules are sensitive to grammatical considerations, and may tolerate exceptions (obese retains long [i:] in obesity, even though trisyllabic laxing would be expected to occur).

Processes, on the other hand operate across the board with no exceptions.

Rules need to be learnt, processes are (at least partially) unlearnt.