Phonetic implementation

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Some issues

• From a metatheoretical point of view: do we need phonological explanations for phenomena which can also be explained phonetically, or vice versa? (cf. this course, *passim*)

• From the point of view of the analyst: how do we decide whether a given phenomenon should be given a phonological or a phonetic explanation?

• From the point of view of language acquisition and diachrony: how does phonetic markedness get into the individual grammar?

• From the point of view of the architecture of the grammatical model: how do phonology and phonetics interact within the grammar? What is the nature of ‘phonetic interpretation’?
Traditional feed-forward model

(1) Lexical representation (categorical)
   \[\downarrow\]
   Phonological rules
   \[\downarrow\]
   Phonological representation (categorical)
   \[\downarrow\]
   Phonetic rules
   \[\downarrow\]
   Phonetic representation (gradient)
Monostratalism (e.g. exemplar)

(2) Phonetic representation (gradient)
What an item looks like

(3)
A mixed-model of the grammar

(4) Lexicon (categorical) ↔ Phonology (categorical)

↓   ↓   ↓   ↓

hん?ṭę ħnTheo ħnđę
h prévu
hčnd
hɔnt
hɔnʔ
hūt
Laboratory arguments for modular feed-forward

- From a number of experiments it appears that there is a ‘phonological buffer’: phonological structures are first built up before they are interpreted phonologically. This explains speech errors, but also the fact that people seem to take time to compute predictable information, rather than retrieving everything from lexical storage, and that “assembly of longer phonological plans takes longer than assembly of shorter plans”.

- The phonetic realisation of e.g. intonational or even lexical tones can only be computed if we know the context in which these occur: a specification for high tone means that the tone is high \textit{relative to the context in which it occurs}, not that it is pronounced at so-and-so many Hz.
Some other arguments

- We can distinguish logically between two types of knowledge: *declarative memories*, i.e. lexical/phonological representations (“I know *that* the word *man* consists of one stressed syllable”) and *procedural memories*, i.e. phonetic know-how (“I know *how* to pronounce */m/*: by closing my lips and then letting the air escape through the nose”). “The mere fact of this distinction provides a basic argument for a modular theory”

- “A related fact is the outcome of Neogrammarian sound changes (which enter the language as allophonic processes and may eventually become fossilized across the entire vocabulary).” Across-the-board changes such as these are hard to capture in a model which does not allow for any kind of abstraction.
Laboratory arguments for exemplars

- The pronunciation of the vowel in CVC words depends on ‘neighbourhood density’. The neighbourhood of a word W are the words which are similar to it (man has in its neighbourhood the words ran, mac, mine, etc.) If this neighbourhood is dense — if it contains many words — people tend to make a more ‘extreme’ version of the vowel.

- Similarly, there is more reduction in frequent words than in infrequent words.

- Speakers are influenced in their production of words by recent memories of other speakers pronouncing the same words.

- Phonetic details sometimes seem sensitive to morphosyntactactic structure. For instance, there is more glottalisation before the a in realign (morphologically related to align) than before the a in realize.
Other arguments for exemplars

- Language change sometimes is sensitive to lexical frequency: certain changes occur earlier in highly frequent words than in less frequent words. They are also sensitive to lexical class: in Québec French, some vowel shift affected all words, except for those “representing organs of the church, the military and the schools”.

- Phonetic implementation may be due to sociolinguistic factors. E.g. “Oprah Winfrey displayed the ability to shift her speech style between a more AAVE influenced style to more mainstream style, depending on the subject matter she was speaking about”; or “Her Majesty Queen Elizabeth II [. . . ] gradually shifted her pronunciation in the direction of the Southern British English which has become fashionable with younger speakers” in radio speeches over the past decades.
Exemplars and sound change

- Feedforward models seem to be particularly good in describing processes of Neogrammarian sound change, i.e. sound changes which are across-the-board and affect individual sounds rather than individual words.
- Exemplar models seem better in describing processes of lexical diffusion in which some individual words change, after which other words may follow, etc.