

Phonetics-phonology mismatches

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The history of phonological features and their phonetic implementation in modular grammar theories revolves around the idea that every feature should be associated with one phonetic characteristic, following thus a one-to-one mapping between phonetics and phonology.

The specification for voicing contrasts of non-glottalised plosives, for instance, moved from Jakobson, Fant & Halle's (1952) [voiced] vs. [voiceless], associated with the presence vs. absence of vocal fold vibration and its percept, to [±stiff vocal folds], [±spread glottis] and [±constricted glottis] by Halle & Stevens (1971), each with its own articulatory definition, to the proposal of just one feature [±voice] referring to different regions on the single acoustic dimension of Voice Onset Time (Lieberman 1977, Keating 1984). Recent phonological analyses of voicing (see e.g., Beckman et al. 2013, Honeybone 2005, Iverson & Salmons 1995) agree that two features, [spread glottis] and [voice] (or equivalents), are necessary to be able to account for the articulatory and acoustic differences between aspiration and true voicing, but also for their asymmetrical phonological behaviour (languages employing [voice] show voicing assimilation in obstruent clusters, while those with [spread glottis] show devoicing in such clusters).

An assumption explicitly or implicitly made in these approaches is that the mapping between features and their phonetic implementation is innate and therefore universal. Whether the phonetic implementation concerns an articulatory, acoustic or perceptual form, or all three, varies across these approaches.

In the present talk, I depart from the idea of a universal, innate mapping and assume **language-specific, acquired mappings** between phonetics and phonology (e.g., Mielke 2008, Boersma 1998) instead. Furthermore, I assume **primacy of perception**, i.e. that phonological features map directly onto a perceptual form and vice versa (Boersma 1998, 2007) because spoken languages (including their phonological representations) are acquired on the basis of perceptual input. The fact that listeners are more aware of the presence of perceptual information than its lack results in learned phonological features that often mirror perceptually salient cues. For the example of voicing contrasts in plosives, it is the salient presence of periodicity and aspiration noise (rather than their non-salient absence) that results in the postulation of privative features such as [voicing] and [spread glottis]. A one-to-one or transparent mapping between phonetics and phonology can thus be restricted to a by-product of perceptual feature learning rather than a stipulated universal property of the grammar or acquisition device.

An advantage of the proposed language-specific acquisition of features is that it also allows for non-transparent mappings, i.e. mismatches between phonetics and phonology, where phonological features have unexpected phonetic implementations. Such mismatches arise through either a gradual shift in a perceptual cue or its replacement by another cue across generations. For the example of plosive voicing contrasts, the pitch-lowering effect of voiceless stops on following vowels can be used as additional perceptual cue to voicing, and later generations might use it as the only cue to the voicing contrast, creating a mismatch situation. This mismatch might be resolved by even later generations who interpret the pitch cue as a tone contrast rather than a voicing contrast (see Jakobson's 1931 and Hyman's 1976 proposals for the emergence of rising tones in Chinese dialects and South-Asian languages, respectively). Another

example of plosive voicing mismatches can be found in present-day English, where syllable-final voicing is often only cued by a durational contrast in the preceding vowel.

In this talk, I elaborate these and two further cases of phonetics-phonology mismatches illustrating that such mismatches are the natural consequence of purely phonetic (*Neogrammarian*) changes, which are problematic for grammar models that assume universal mappings between phonological features and their phonetic implementations.

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