

Lingual implementations of non-lingual features: cross-linguistic data from Turkish,
Japanese, and French

Adam Baker, Alina Twist, Yuko Watanabe and Diana Archangeli
University of Arizona

Ultrasound analysis of a variety of non-lingual features (e.g. [round], [nasal], and [voice]) shows that such features may actually receive lingual phonetic implementation. This is inconsistent with classical understandings of features (e.g. Chomsky & Halle 1968), but consistent with Emergent Feature Theory (Mielke 2004).

Native speakers of Turkish, French, and Japanese produced multiple tokens of minimal pairs that contained vowels that contrasted different phonological features: [round] (Turkish), [nasal] (French), and [voice] (Japanese). The statistical analysis revealed a significant difference in the tongue contours for most of the vowel pairs, indicating that tongue position can be affected by the quality of non-lingual features. In order to account for the variability of tongue position, features must be interpreted in a way that is sensitive to context. For instance, to represent rounding in Turkish:

$$\left. \begin{array}{l} +\text{high} \\ +\text{round} \\ +\text{back} \end{array} \right\} \rightarrow \text{'round lips, advance tongue to } x_1, \text{ raise tongue to } y_1 \text{'}$$
$$\left. \begin{array}{l} +\text{high} \\ -\text{round} \\ +\text{back} \end{array} \right\} \rightarrow \text{'unround lips, advance tongue to } x_2, \text{ raise tongue to } y_2 \text{'}$$

This indicates that features do not have an independent phonetic implementation, but rather that entire feature matrices must be targeted by the phonetic implementation module of the grammar. The findings are consistent with Emergent Feature Theory (EFT; Mielke 2004). In EFT, sound patterns arise when speakers form generalizations based on gross phonetic similarities between phonetic segments. EFT, then, is capable of accounting for the presence of lingual correlates that accompany non-lingual features without making counterfactual phonetic predictions.

Chomsky, N. and M. Halle. 1968. *The Sound Pattern of English*. New York: Harper & Row.

Mielke, J. 2004. *The Emergence of Distinctive Features*. Doctoral dissertation, Ohio State University.