**The Distribution of Acoustic Cues of Prominence and Contrasts of Languages**

One aspect of linguistic typology is the relationship among the properties of languages and in particular, the ability to predict the manifestation of a given property based on the manifestation of another property of the language. We examine the relationship between the acoustic properties of prominence (stress / word level and focus / phrasal level) and lexical phonological properties of a language, given that the same properties may be used for both contrast and prominence (e.g. duration, F0, spectral properties).

While the Functional Load Hypothesis was originally developed to account for historical change, an extension can be used as the basis for synchronic relationships between properties within a language.[1]

Thus, in the present research, part of a larger cross-linguistic study, we test several predictions: a) if a given property is used for lexical contrast (e.g. contrastive V length) it will be avoided, or at least used minimally, in the manifestation of prominence at any level, b) the use of a given property to express lexical prominence will eliminate, or reduce, its use as a manifiestation of phrasal prominence, c) if a property is predictable (e.g. position of stress), its manifestation will be less precise than if it is contrastive.

The languages examined are three with contrastive vowel length (Hungarian, Finnish, Arabic), four with predictable (lexical) stress (quantity insensitive: Hungarian, Finnish, Turkish; quantity insensitive: Arabic), two with non-predictable / contrastive stress (Spanish, Greek) and two claimed to have no stress (Korean, Indonesian).

The data are collected in strictly controlled experiments to permit the maximal possibility of comparison across languages (10 speakers per language; 120 – 240 vowels per speaker depending on the contrasts of the language). Moreover, we avoid a common confound seen in previous studies of stress where the targets are in carriers such as "George said the word ***XXX*** three times" such that stress measurements also include focus properties.

Thus far, measurements have been made for Hungarian, Turkish, Spanish and Greek; the other languages are in process. Mean F0, duration, mean amplitude and degree of vowel centralization have been measured and examined with binary logistic regression (BLR) analyses to assess the relative contributions of each property.[2] With regard to our specific predictions, the BLR classification results show, among other things, that a) in Hungarian, duration is not a significant property of either stress or focus, while it is used in Greek and Spanish, b) while duration is a significant property of focus in Spanish, it is not also used for stress – though it does seem to be used for both in Greek, c) overall correct BLR classification of stressed vs. unstressed syllables in Hungarian and Turkish, where stress position is predictable, is less successful than in Spanish and Greek, indicating that the latter provide clearer acoustic cues as this is the only way to signal the location of the stressed syllable. In the full paper, more detailed analysis of these languages as well as the others will further test the predictions made above.

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[1] With respect to prosody, see among others: a) Remijsen, B. (2002). Lexically contrastive accent and lexical tone in Ma'ya. In C. Gussenhoven and N. Warner (eds.) *Laboratory Phonology 7*. Berlin: Mouton de Gruyter. pp. 585-614; b) Remijsen, B. and V. van Heuven (2005). Stress, tone and discourse prominence in the Curaçao dialect of Papiamentu. *Phonology*. 22:205-235.

[2] Ramus, F., M. Nespor, M., & J. Mehler, J. (1999). Correlates of linguistic rhythm in the speech signal. *Cognition 73*, pp. 265-292.