

A FUNCTIONAL-LOAD ACCOUNT OF GEMINATE CONTRASTIVENESS:
EVIDENCE FROM CYPRIOT GREEK

Motivation Phonetic studies of geminates do not typically address the question of what motivates the fine-grained linguistically-relevant variation, particularly along the primary acoustic correlate of a singleton-geminate contrast, constriction duration (Kawahara, in press). In the present study we argue that a major factor contributing to the variation is the measure Functional Load (henceforth FL) (Hockett, 1955). FL is a measure of how much a language makes use of a particular contrast, such that it is likely to be lost if the language makes little use of it in distinguishing words. Crucially, this relationship is more than simply correlative (see Wedel et al. (2013) for an extensive statistical evidence in modelling mergers in eight different languages). Using Cypriot Greek as a test case, this paper argues that the pattern of variation in the phonetic realisation of geminates can be explained in terms of FL. We provide a proof-of-concept that FL, computed from a less-than-ideal corpus such as a word list, is sufficient for predicting fine-grained differences between phonemic contrasts.

Corpus An online dictionary, Lexical Database of the Cypriot Dialect (Themistocleous et. al. 2012), was used to compute FL. This dictionary is compiled using modern sources of Cypriot Greek, such as blogs, oral speech and more. A word list is far from ideal, since it lacks token frequency information. However Graff (2012) showed that it is possible to model lexical contrastiveness using entropy norms (e.g. FL) for 50 languages using word lists.

Analyses Tserdanelis & Arvaniti (2001) tested 10 singleton-geminate pairs – /t,p,k,l,r,m,n,s,ʃ,tʃ/, and calculated the F-values of the durational contrast for each pair; the higher the F-values, the stronger the contrast. Overall, a non-parametric correlation (Kendall) of F-value-FL, testing for a positive association, yields a significant result ($p < 0.05$, $\tau = 0.54$), thus confirming our hypothesis: *the higher the FL, the stronger the durational contrast*. Examining the data in terms of manner, we found that the FL values make a near-perfect prediction of the trend by durational contrast (see table; “>” being “more contrastive than”). The only exception is /p/-/p:/ > /t/-/t:/.

Stops	Sonorants	Fricatives
/t/-/t:/ > /p/-/p:/ > /k/-/k:/	/l/-/l:/ > /r/-/r:/ > /m/-/m:/ > /n/-/n:/	/ʃ/-/ʃ:/ > /tʃ/-/tʃ:/ > /s/-/s:/

The only statistically *insignificant* pair reported was /k/-/k:/, with half the speakers having the same duration (and VOT), caused by a specific test-word [ˈfɛkɐ], for which native speakers had divided opinions about its singleton status. This interspeaker lexical variation suggests that /k/-/k:/ contrast is perhaps undergoing merger. This is supported by its relatively low FL under the variationist/usage-based/evolutionary models (VUE) (Blevins & Wedel, 2009). It has been shown that phoneme contrasts distinguishing minimal pairs are relatively hyperarticulated in production (Baese and Goldrick, 2009), and since phonetic details can spread within a community over time from word to word (Bybee, 2002), the VUE models would predict that frequent phonetic enhancement of a contrast in speech will over time become reflected in lexical representation.

Conclusion The study presents new evidence consistent with VUE, showing that simple measures of functional load can not only predict fine-grained phonetic differences between members of phonemic contrasts, both across and within natural classes, but also even suggest possible mergers in progress. We established proof-of-concept that a simple word list alone can be sufficient for modelling phonemic contrasts. Finally, a methodological lesson for future studies would be not only to report phonetic measurements, but also to take into account the distribution of phonemes across the lexicon, even when dealing with languages for which we have limited corpora.