

Domain-initial strengthening and the phonetics and phonology of positional neutralization

Domain-initial strengthening is well recognized as a feature of the prosodies of many languages. Experimental studies (e.g. Byrd 2000, Dille, Shattuck-Hufnagel and Ostendorf 1996, Fougerson and Keating 1996, Oller 1973) have investigated the phenomenon, and have begun assessing cross-linguistic variation in its implementation. Both consonants and word-initial vowels are regularly subject to this strengthening, but it is less clear whether initial-syllable vowels preceded by onset consonants undergo it as well. Fougerson and Keating, demonstrating clearly initial strengthening of consonants in English, find little evidence of lengthening of initial-syllable vowels. Byrd obtains similar results. Both studies, however, contain idiosyncrasies of design which could inadvertently mask the presence of the effect.

The results of these studies are furthermore puzzling in light of the typological frequency of vowel-quality neutralizations in non-initial syllables, suggesting that initial position bears some type of positional prominence. If the fuller inventories of consonants commonly available word-initially are the phonologized result of phonetic strengthening processes, we might expect to find similar phonetic processes underlying the asymmetries in the realization of vowels as well. Beckman 1998 and others cite initial syllables as bearing psycholinguistic prominence, in contrast to e.g. stressed syllables, which are said to be prominent only phonetically. Because initial syllables are more important for lexical access, it is crucial that all contrasts be maintained there, even if this means violating lower-ranked constraints neutralizing those contrasts in other positions. For Smith, psycholinguistically prominent positions are protected by Positional Faithfulness constraints à la Beckman, while phonetic prominence is treated by a Augmentation constraints requiring certain phonetic features to appear in the relevant positions.

This paper presents the results of a carefully-designed experimental study of initial syllables in English and Turkish. Durations of initial-syllable vowels are compared to those of second-syllable vowels in real-word tokens for both languages, controlling for stress and segmental environment. Frame sentences were constructed to assess the effect of magnitude of domain-boundary on any lengthening found. Schematic examples from the English study are shown in (1). Turkish, like English, is known to strengthen initial consonants, particularly as concerns VOT for voiceless stops (Barnes 2001). But here the similarities end. This investigation supports the findings of others noted above regarding English vowel durations. No significant difference is found between initial and non-initial vowels in any of the prosodic domains tested. Turkish, however, shows statistically significant differences between durations of initial and non-initial unstressed vowels in the higher prosodic domains. Implications are as follows.

The potentially-universal phenomenon of initial strengthening is shown to be subject to language-specific variations in implementation. I argue that these variations follow directly from the nature of the prosodic systems of the languages in question. English stress is cued in large part by vowel duration. Additional positional perturbations of this feature could thus interfere with the perception of stress, and are avoided. Turkish stress, however is cued only by F0 (Konrot 1981), and so vowel duration is free to vary as a boundary signal as needed. Initial lengthening should thus be found only in languages where vowel duration is not a primary cue of stress. This last proves crucial in predicting the distribution of certain types of vowel harmony as well. Finally, since both consonants and vowels exhibit initial strengthening, we can now understand the positional resistance to neutralizations of these both with reference to their phonetic characteristics alone. Appeals to psycholinguistic prominence, or to two separate classes of constraints to handle licensing asymmetries are unnecessary. Initial position surely does have some special importance in lexical access, but typological regularities found in positional neutralization patterns therein emerge neatly from the phonetics alone.

- (1) a. Utterance-initial: U[Phr[X is an interesting topic.
 b. Phonological Phrase-initial: U[Phr[I think]Phr[X is an interesting topic.
 c. Word-initial: U[Phr[Y X compound] is an interesting topic.

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