

Is there really a Prosodic Hierarchy in Polish?

Prosodic Phonology (e.g. Nespor and Vogel 1986) postulates the existence of a universal Prosodic Hierarchy that imposes structural domains on all languages. The Prosodic Hierarchy is claimed to interact with segmental phonetics, and different theories have been proposed with regards to both the nature of this relationship and the direction of prosodically-induced variation in segments (e.g. Keating 1984, Cole et al. 2007, Cho and Jun 2000). The phonetic experiments designed to test these theories appear to provide conflicting data. For instance, findings from English suggest that voiceless plosives in general have higher VOT values at higher prosodic domains (Choi 2003, Fougeron and Keating 1997), whereas Dutch shows VOT shortening at the start of higher domains (Cho and McQueen 2005). Therefore, the universality of the Prosodic Hierarchy may be questioned (cf. Schiering et al. 2010).

Schwartz (2016) provides an account of how different prosodic domains may emerge in different languages, allowing for two different types of predictions with regard to the phonetics of segments, shown in Figure 1 with respect to the consonant /t/. ‘Submersion’ systems (right) build prosodic structure by embedding smaller units inside larger domains. Since the first /t/ is housed at the top of the representational hierarchy, significant strengthening effects are predicted (Choi 2003 for English). ‘Adjunction’ systems (left), in turn, place initial and non-initial ‘segments’ on the same hierarchical level. This results in negligible strengthening effects, if any, since the structure is flat. This is the system that we hypothesise obtains in Polish.

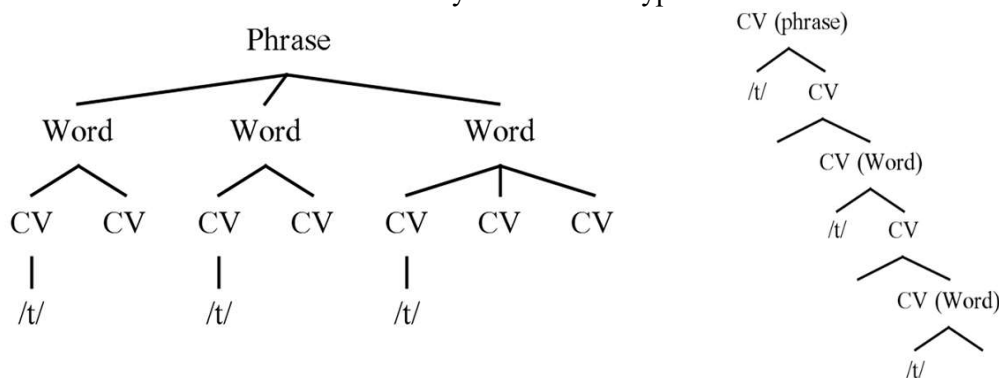


Figure 1. ‘Adjunction’ (left) and ‘submersion’ (right) systems (after Schwartz 2016)

To test this, 24 disyllabic words starting with /p, t, k, b, d, g/ and followed by /a, ε, ɔ, i/ were couched in carrier sentences; the items were elicited in three different prosodic positions: utterance-initial, phrase-initial, and phrase-medial, in both accented and unaccented conditions. Production data from 20 monolingual native speakers of Polish were collected, yielding a total of 2727 tokens. Linear Mixed Models were run with four different acoustic measures as dependent variables (VOT, vowel duration, F1 at vowel onset, and pitch at vowel onset), Position and Accent as fixed factors, and Speaker and Item as random factors.

In both series of stops, phrase-initial items revealed the longest positive and negative VOT, but these effects were small in magnitude, and no difference was found between utterance-initial and phrase-medial tokens. In the voiced series, accent and phrase-initial position yielded longer negative VOT, but a considerable number (11.3%) of these tokens were produced with a break in pre-voicing, so we cannot claim that these conditions strengthened the feature [voice]. With regards to vowel-based laryngeal cues, no effects on pitch and F1 between utterance-initial and phrase-initial items were found, but pitch was generally lowered in phrase-medial tokens. Finally, no significant effects of Position on vowel duration were found. Overall, our results show minimal and inconsistent segmental strengthening effects, as suggested by the adjunction system in Figure 1.