Towards a typology of consonant synchronicity

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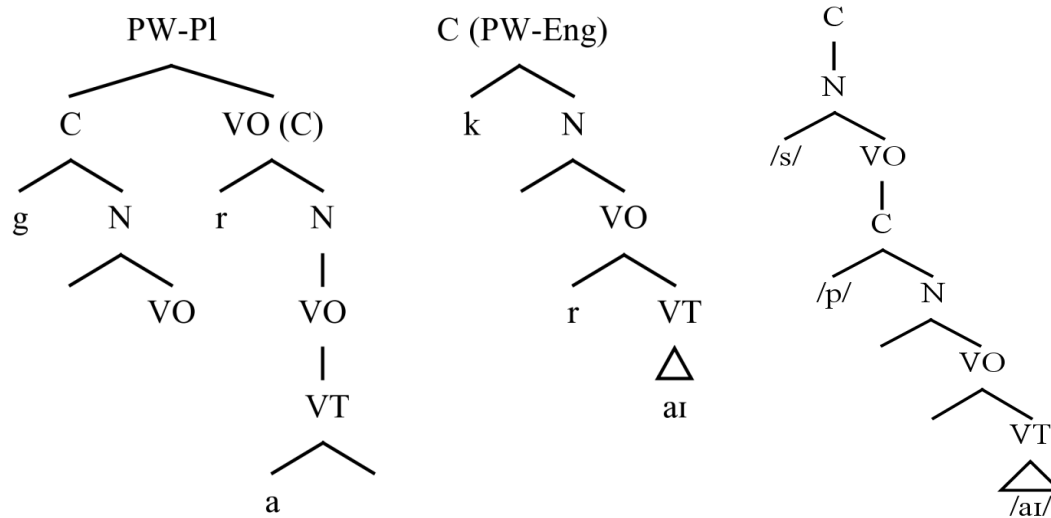*Adam Mickiewicz University in Poznań*

A comparative EMA study of Polish and Tashlhiyt Berber [1] reveals conflicting evidence with regard to the syllabic organization of consonant clusters in Polish. On the one hand, unlike in Tashliyt, right-edge-to-anchor variability was significantly greater than center-to-anchor variability, a finding that suggests 'complex' onset organization in line with established phonetic heuristics [2]. On the other hand, target-to-target lags were notably greater in Polish than in Tashlhiyt. That is, Polish clusters exhibited less synchronicity in cluster timing. If the consonants in the Polish clusters reflected a single 'onset' constituent, as is suggested by the 'complex' onset interpretation, this latter finding is surprising. We should expect greater phonetic cohesion within a single prosodic constituent (complex 'onsets' in Polish) than in a consonant sequence spanning multiple constituents (simplex 'onsets' in Tashlhiyt).

Additional evidence of asynchronous cluster organization in Polish has been observed in the form of numerous intrusive vocoids in onset clusters of various types [3], [4] and asynchronicity in the production of the so-called 'palatalized' stops [d^j] [b^j], which are in fact stop-glide clusters [5]. Beyond this, there is phonological evidence to suggest that 'onset' clusters in Polish bear prosodic weight [6], [7]. CV content words in Polish are prosodically sub-minimal – there are no nouns in the language that have this shape – while CCV words are perfectly well formed. These facts suggest that the first consonant of a cluster in Polish bears a certain degree of prosodic autonomy, resulting in a lack of synchronicity in cluster production, which appears to be an inherent aspect of Polish phonology. The question that remains is how cluster synchronicity may be encoded in phonological representations.

The Onset Prominence (OP) framework [7], [8] offers tools for the representation of three different degrees of cluster synchronicity. Consonant sequences may be absorbed at the same representational level, in which case their articulation is tightly coordinated. This configuration obtains in 'rising sonority' clusters in languages such as English – synchronous articulatory coordination is evident in processes such as approximant devoicing (e.g. *clear*), TR affrication (*try*) and coalescence of /tj/ and /dj/ (*tune*). Clusters may be adjoined at a higher level, in which case they should be asynchronous, and act as if they are separate prosodic units. This is posited for Polish. Alternatively, consonants may be 'submerged', i.e. joined into a single structural constituent, but at different representational levels, yielding an intermediate level of phonetic cohesion. This configuration is posited for non-TR onsets in English, and all clusters in Tashlhiyt. The three configurations are shown in (1). On the left we see an adjoined /gr/ cluster in the Polish word *gra* 'game'. In the center we see an absorbed /kr/ cluster in English *cry*. On the right we see a submerged /sp/ cluster in English *spy*. Crucially, these configurations are the products of independently motivated mechanisms in the OP representational system.

In most EMA research, the organization of 'onsets' is computed with respect to anchors housed later in the syllable. Researchers have varied in their choice of anchor. Some opt to use landmarks associated with a post-vocalic consonant, while others calculate articulatory coordination with respect to a vocalic 'nucleus'. In some cases [2], anchor choice has been found to affect findings with regard to the simplex vs. complex onset hypothesis. The OP approach alleviates this problem by limiting its predictions to target-to-target lag in consonant sequences. Since relative to 'onsets', vowels and post-vocalic consonants play a minimal role in determining phonological constituency in the OP system, they are predicted to be somewhat unreliable as reference points for syllable structure. Rather, cluster synchronicity is a function of timing relations between consonants only.

(1)   From left: OP representations for Polish *gra* 'game', English *cry*, and English *spy*

PW-Pl   C (PW-Eng)   C
                                             |
  C   VO (C)   k   N   N
                                          /s/   VO
g   N   r   N   VO |
                                                  C
     VO   VO   r   VT   /p/   N
           | △   VO
           VT   aɪ   VT
                                                      △
     a   /aɪ/

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