A Foot-Based Approach to Interactions of Tonal Accent and Consonantal Strength

Björn Köhnlein & Ian S. Cameron
The Ohio State University

Goal. We propose a first-time synchronic, foot-based analysis of predictable interactions between tonal accent and word-medial consonant voicing in Franconian dialects. As we show, this approach is comparable to the foot-based analysis of ternary quantity in Estonian and its interaction with consonant gradation (based on Prince 1980, Odden 1997). Furthermore, we argue that the generalizations on Franconian are hard to express with an approach based on lexical tones. Our presentation contributes to two ongoing debates in prosodic typology: 1. the interaction of voicing and metrical structure, and 2. the phonological representation of tonal accent.

Background. The term ‘tonal accent’ is used to refer to prosodic systems that show lexically distinctive tonal contrasts between two accents, but limit these oppositions to syllables with word stress. The traditional, ‘tonal approach’ holds that tonal accent is synchronically derived from a lexical tonal opposition that interacts with stress and intonation (Gussenhoven 2004 for an overview of tonal analyses of several tone-accent systems, such as Franconian, Swedish, and Norwegian). More recently, an alternative ‘metrical approach’ has been developed, where tonal differences between the accents in at least some tone-accent systems are attributed to two different types of feet, which then leads to different mappings of intonational tones (see, e.g., Iosad 2016 for dialects of Danish; Hermans 2012, Köhnlein 2016, Kehrein 2018, Van Oostendorp 2018 for Franconian; Iosad 2015, Morrison to appear for Scottish Gaelic; Morén-Duolljá 2013 for Swedish). Proponents of the metrical approach typically argue that there is independent evidence in favor of such foot-based analyses, which is also at the core of our presentation.

Issue and data. It is a well-established phonological generalization that foot-medial onsets tend to undergo lenition (e.g. Honeybone 2012, Katz 2016); conversely, we propose that word-medial consonant quality can also affect footing. Our main empirical evidence comes from West Germanic (Franconian) tone-accent systems that contrast Accent 1 and Accent 2. In some dialects, the voicing quality of post-tonic onsets correlates with accent assignment. For purposes of exposition, we use Aegidienberg (Müller 1900) and Cologne (e.g. Münch 1904) as examples. As already observed by both Müller (1900: §3) and Münch (1904: §21), disyllabic words with word-medial lenis consonants (voiced obstruents, sonorants) always have Accent 1 in these dialects (we discuss a few apparent, yet morphologically conditioned exceptions); words with word-medial fortis consonants (voiceless obstruents) typically have Accent 2, but may have Accent 1:

(1) Interactions of voicing and tonal accent (examples from Aegidienberg, Müller 1900: 4)

Analysis I: tones. Assuming Köhnlein’s and Van Oostendorp’s representations, Accent 1 is a disyllabic foot, and Accent 2 is a monosyllabic, bimoraic foot. Following Köhnlein (2011, 2016), headedness is determined at the highest level where the foot is binary (e.g. Morrison 2018 for a similar treatment of tonal accent in Scottish Gaelic; Köhnlein & Zhu 2019 for tone in Uspanteko). Declaratives have a H*L pitch accent, interrogatives L*H. Accent-1 feet are binary at the syllable level. The first syllable is the head (σ’) and licenses a tone on each of the two moras, which inherit their ‘strength’ from the syllabic foot head; this results in HL (shown in (2), left) or LH. Accent-2 feet are not binary at the syllable level, but (only) at the mora level: The first mora is the head (μ’) and can host a tone. The second, dependent mora (μ’) is ‘weak’ and cannot host a tone. Instead, it receives its tone from the first mora via spreading, leading to a high-level tone (2, right) or a low-level tone in the accent syllable; trailing tones occur post-tonically. Unparsed syllables link directly to the prosodic-word node (left out in (2) for reasons of space).

Analysis II: voicing. Words with intervocalic lenis consonants receive Accent 1 because lenis is preferably foot-medial (2, left), in line with cross-linguistic tendencies. Intervocalic fortis typically blocks the assignment of a disyllabic foot, leading to a monosyllabic Accent-2 foot (2, right). Cases where Accent 1 does occur with foot-medial fortis (e.g. [ro:’fan] ‘call’) are predicted if Accent-1 feet can be lexically assigned (as argued in Köhnlein 2016). Since both accents can have H or L pre-consonantally (depending on declarative or interrogative intonation), the observed effects cannot be attributed to direct tone-voicing interactions, favoring a metrical analysis.
A Foot-Based Approach to Interactions of Tonal Accent and Consonantal Strength
Björn Köhnlein & Ian S. Cameron
The Ohio State University

(2) Voicing, foot structure, and tonal mapping for Accent 1 (left) and Accent 2 (right)

Estonian parallels. Our approach to segmental structure and its interaction with metrical structure is comparable to the analysis of Estonian overlength by Prince (1980) and Odden (1997). Estonian is a language known for its ternary quantity contrast:

(3) Ternary quantity in Estonian
Q1 [sata] ‘hundred’, Q2 [saata] ‘send’ imperative, Q3 [saaːta] ‘to receive’

The existence of this ternary contrast has challenged the assumption that phonological contrasts are necessarily binary, suggesting three degrees of underlying phonemic length. The metrical analyses proposed by Prince and Odden retain binarity by proposing two contrastive foot structures. Ternary quantity derives from the phonetic realization of a foot: The duration of the monosyllabic foot is expressed in only one syllable, leading to ‘overlength’ (Q3); in Q2, the duration of the foot spreads over two syllables, leading to ‘normal length’. Estonian also features morphophonological alternations, known as gradation, characterized by the strong grade (typically with word-medial fortis consonants), and the weak grade (typically with word-medial lenis consonants). In the metrical analysis, the disyllabic foot corresponds to the weak grade, and the monosyllabic foot corresponds to the strong grade. The gradation facts can then be accounted for by stating that word-medial consonants in the disyllabic foot are preferably lenis, whereas word-medial obstruents, which are outside the domain of the foot, are preferably fortis (see Prince 1980, Odden 1997), as shown in (4) – exactly as we claim for Franconian.

(4) Voicing, foot structure, and tonal mapping for Q2 (left) and Q3 (right) in Estonian gradation

There are two more parallels between Estonian and Franconian. First, as described in Gussenhoven & Peters (2004) and Peters (2006), Accent 2 (the monosyllabic foot in our approach) is significantly longer than Accent 1 (the disyllabic foot) in Cologne Franconian, which parallels Prince’s and Odden’s analysis of Estonian quantity. Furthermore, it has long been observed that the Estonian H*L contour is distributed over two syllables in Q2, while the locus of the H*L contour is entirely in the first syllable for Q3 (Lehiste 1997, among many others; representations in (4)). Comparing (4) to (2) reveals that this is the opposite tonal mapping than in, e.g., Cologne; yet descriptions of other Franconian dialects (e.g. Arzbach Franconian, Bach 1921, Köhnlein 2011) show similarly ‘reversed’ melodies. Following Köhnlein (2011, 2016), the Arzbach system can be analyzed by assuming that strong moras, which are linked to the head position of a foot, avoid low tone (*HEAD/L, de Lacy 2002), so that L will have to be realized on weak moras. As shown in (4), restricting L to weak moras also successfully accounts for the Estonian facts.