

Initial Syllable Faithfulness in the Realization of Norwegian Tone  
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It is well-established that the phonetic implementation of phonological structure extends beyond physiological and perceptual reflexes. Supporting evidence comes from the study of diverse phenomenon, including extrinsic vowel duration and vowel nasalization, and transitions between lexical tone (c.f. Keating 1985, 1990; Flemming 2001). Following from the idea that phonetics is in the grammar, an accurate model of phonetics must include a level of abstraction beyond acoustic and articulatory considerations. The observation that phonetic and phonological processes often coincide has moved some researchers to advocate for an integrated approach to phonetics and phonology (c.f. Flemming 2009). Areas of potential overlap between phonetic and phonological processes that have not yet been investigated could inform developing models. For example, phonological strength effects have been tied to word-level structural positions such as word and root-initial syllables (Beckman 1998; Smith 2002), but initial syllable phonetics with the exception of stressed initial syllables, have been under-investigated.

The purpose of this paper is to investigate the nature of tonal transitions in word and root-initial syllables as well as in affixes and word-medial syllables. Norwegian is particularly suited to this task because it exhibits both rich morphology and lexical tone. I have organized this paper as follows. In Section 2, I introduce what are known as Norwegian's pitch melodies, LH and HLH, comprised of both lexical (L and HL) and prosodic tone (the final H tone of the pitch melody). In Section 3, I discuss the methodology of the investigation. For example, in order to describe the transition between lexical H and L tones in the HLH pitch melody in the relevant structural positions, I measured the maximum and minimum  $F_0$  of a given syllable and calculated the rate of transition. In Section 4, I report the findings, which suggest that Norwegian realizes lexical tone more faithfully in the initial syllable of a word than it does word-medially. Finally, In Section 5 I introduces Flemming's (2009) OT grammar of coarticulation and proposes the addition of a positional faithfulness constraint to the IDENT-TONE family.

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