Prosodic Tone with Segmental Pitch

Tones interact with segments' laryngeal features in ways that are problematic for the view that tone associates exclusively with prosodic units (typically moras or syllables; e.g., Zec 1988, Hyman 1985, Hayes 1989, also Goldsmith 1976). In Zulu, syllables with voiced obstruents must be extra-low toned: *ísîfúːndȍ* "lesson"; *ízȉfúːndȍ* "lessons" (Laughren 1984). These "depressor consonants" also block high tone (H) spreading. Voiced obstruents seemingly come prelinked to extra low tones. This is impossible if the mora is the tone-bearing unit (TBU) in Zulu, as Laughren argues. In Bade (Schuh 1978), non-glottalized voiced obstruents block H spreading: */nə́n dàmáw/ → nə́n dámáw* "I submerged"; */nə́n gàfáw/ → nə́n gàfáw* "I caught" (**gáfáw*). If these segments are associated with a low tone (L), this is explained by the Line Crossing Prohibition. Such a solution is unavailable if we take seriously the proposal that TBUs are necessarily prosodic.

To capture these facts in Optimality Theory (Prince and Smolensky 1993), this paper augments the generally successful approach of prosodically associated tone with independent segmental pitch features (cf. Ladefoged 1989, Duanmu 1991) under the laryngeal node. Constraints can militate against marked pitch/tone configurations ("REALIZE-T(one)" constraints, e.g., REALIZE-H: "Segments dominated by a high-toned mora/syllable must not have non-high pitch features"), enabling us to account for the apparent segmental qualities of tone. A constraint *D[HIGH PITCH] prohibiting high-pitched voiced obstruents on articulatory grounds (Maddieson 1997) combined with REALIZE-H can block H spreading when ranked above the spreading constraints. Thus depressor consonants are accounted for without postulating segmentally linked tones. Low-pitched consonants, through *D[HIGH PITCH] and REALIZE-T, can force their syllables to be (extra-)low-toned. As a laryngeal feature, pitch naturally interacts with other laryngeal features, as in Zaiwa, where an onset's voicing, aspiration, and voice quality all affect the syllable's tone (Wannemacher 1998). The REALIZE-T constraints ensure that when features affect pitch, they also affect tone.

Pitch features also provide an account for tonal reduplication (Downing 2003). It is typically assumed in Correspondence Theory (McCarthy and Prince 1995) that only segments stand in correspondence. If TBUs are prosodic units, these units apparently must also stand in correspondence to ensure successful tone copying: *tambalá* "stretch out your legs!" → *tambalá-tambalá* "stretch out your legs repeatedly!" (Chichewa; Myers and Carleton 1996). In ruling out **támbala-tambalá,* syllables/moras must stand in correspondence to ensure that "matching" syllables/moras have identical tone.

In this paper, the reduplicated segments are faithful to the base in terms of pitch features, requiring only IDENT-BR(pitch). With high-ranking REALIZE-T, the only option is to assign H to the syllables/moras dominating the high-pitched reduplicated segments and L to the syllables/moras dominating the low-pitched segments. Pitch identity yields tonal identity.

This paper presents a theory of the interaction of pitch features and prosodically associated tone that simultaneously accounts for tone's prosodic and segmental properties. These interactions account for phenomena like depressor consonants without resorting to exceptional segmental TBUs and let us limit correspondence to segments while accounting for apparent prosodic faithfulness.

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