Overlap-Driven Consequences of Nasal Place Assimilation in Zulu

keywords: place assimilation, gestural overlap

In most contemporary theories of place assimilation (Padgett 1994, Jun 2004), the laryngeal composition of assimilating clusters (e.g. mb from /nb/) is irrelevant to the process of assimilation: the formal representation of assimilated [mb] is such that no interaction is expected with laryngeal neutralization. However, interconsonantal overlap is a known factor both in place assimilation (Jun 2004; Kochetov, Pouplier & Son 2007) and in the triggering of laryngeal neutralization (Chitoran, Goldstein & Byrd 2002). Therefore, if place-assimilated clusters like [mb] are represented as overlapped nasal+stop, the process of place assimilation is predicted to increase the likelihood of laryngeal neutralization on the nasal or on the stop. The present study verifies this prediction by contrasting the behavior of assimilated and unassimilated nasal-stop sequences in Zulu (Southern Bantu). The findings support the inclusion of at least two distinct degrees of overlap between consonants in phonological representations.

Zulu exhibits a direct interaction between place and laryngeal features: in NC clusters that undergo place assimilation, aspirated consonants following the nasal are systematically deaspirated. In this paper, I examine this and other secondary effects of Zulu place assimilation in NC clusters. I propose that all secondary effects are the consequence of nasal place assimilation forcing some NC clusters into close transition. In contrast, unassimilated NC clusters remain in open transition. The hypothesis is currently being tested experimentally.

Some Zulu nasals must become homorganic to a following C; they delete when there is no adjacent C (1a). Others surface in all contexts, with invariant features (1b). I assume that the former nasals are underlyingly placeless and can only surface when place-assimilated. All Zulu N_iC_i clusters where the nasal has undergone place assimilation display secondary effects on C_i. I focus on three effects, shown in (2): de-aspiration of aspirated consonants, affrication of fricatives, and loss of implosion. The presence of these effects in assimilated N_iC_i contrasts with their absence in non-place-assimilated mC clusters, seen in (3). These data suggest that the secondary effects are directly linked to the process of place assimilation. The right theory of place assimilation, then, would also predict these various secondary effects.

I propose that nasal place assimilation in Zulu results in close transition between N_i and the following C_i. In the case of Zulu, the close transition between the segments allows the place gesture of C_i to overlap with the nasal, thus providing the latter with a place of articulation. A side effect of close transition, however, is that other of C_i's gestures also overlap the nasal. This overlap becomes problematic for recovering nasality (cf. Silverman 1997, Browman & Goldstein 2000), particularly when it is overlapped by aspiration and glottalization. The interaction between place assimilation and affrication (e.g. nv $\longrightarrow$mbv) is attributed to the distinct avoidance of nasal continuants, along the lines of Padgett 1994.

The formal analysis includes high-ranked recoverability-motivated markedness constraints as well as a family of Gestural Alignment constraints (Gafos 2002), which ensure that the gestures of C_i remain aligned with respect to each other. When one gesture is initiated earlier as required for place assimilation, Gestural Alignment constraints dictate that all other gestures should be as well. When both recoverability and Gestural Alignment constraints are ranked high (4), the result is that the problematic features are deleted from the entire cluster, as with aspiration (5) and implosion. If Gestural Alignment is ranked below the Max constraint for a particular feature, the result is delayed onset for that feature, as in the case of fricatives hardening into affricates.

Finally, the Zulu data present an intriguing typological distinction. Only mC clusters can be heterorganic; all other NC clusters must be homorganic. The ability of m to resist close transition in CC clusters bears further investigation and suggests that current typologies of place assimilation, such as Jun (2004), which categorizes velars as more resistant to assimilation than labials, may need further refinement.

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(1) a. iziN + -anɬukano ⟶iz-anɬukano 'quarrel'
b. um + -abi ⟶u**m**-abi 'executor'

(2) a. iziN + **ʃ**aŋgane ⟶izin-**tʃ**aŋgane 'wanderer'
b. iziN + **k^{h}**alo ⟶iziŋ-**k**alo 'ridge'
c. iziN + **ɓ**ambo ⟶izim-**b**ambo 'rib'

(3) a. um- + -ɬaba ⟶u**m-ɬ**aba 'world'
b. um- + t^{h}et^{h}o ⟶u**m-t^{h}**et^{h}o 'law'
c. um- + ɓala ⟶u**m-ɓ**ala 'color'

(4) Ident(nas), Dep(place), Align(Place,Lar), *N^{h}>> Max(+nas) >> Max(SG)

(5)

/iziN+k^{h}alo/	Ident (nas)	Dep (place)	Align (Place,Lar)	*N^{h}	Max (+nas)	Max (SG)
☞ iziŋ-kalo						*
izi-k̃alo	*!					
izin-kalo		*!				
iziŋ$_{[-SG]}$k^{h}alo			*!			
iziŋ^{h}k^{h}alo				*!		
izi-k^{h}alo					*!	

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