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The Phonology and Phonetics of Laryngeals in Chinantec

The Phonological Affiliation of [sg] in Ballistic Syllables

Introduction

Possible Domains of [sg] Affiliation

 The Syllable

 The Rime

 The Coda

 The Mora

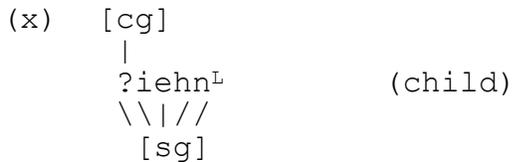
 The Segment

Conclusion

-- their phonetic simultaneity is impossible. We have encoded this phonetic fact as a phonological universal, as there is no evidence in Chinantec or, as far as I know, elsewhere, that requires a phonological representation in which [sg] and [cg] are simultaneous.

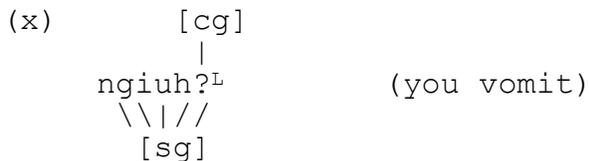
This being the case, the syllabic affiliation of [sg] in ballistic syllables becomes an impossibility. Let us consider why.

Syllabic affiliation of [sg] in ballistic syllables predicts that these syllables may not contain any [cg] specifications, as this would involve the phonological simultaneity of [sg] and [cg], as exemplified in (x).



In (x) we see that a syllabic affiliation of [sg] overlaps with tautosyllabic [cg]. This impossible configuration renders the structure illicit.

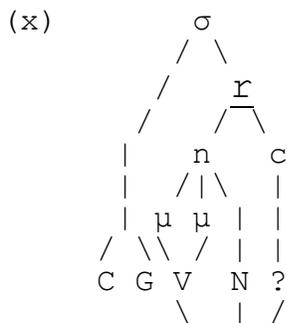
In addition to the predicted disallowability of pre-glottalized syllables, syllabic affiliation also predicts the nonexistence of ballistic checked syllables, as these too involve the phonological simultaneity of [sg] and [cg]. However, glottally checked ballistic syllables freely occur.



For these reasons, I dismiss the possibility that the affiliation of [sg] in ballistic syllables is syllabic.

The Rime

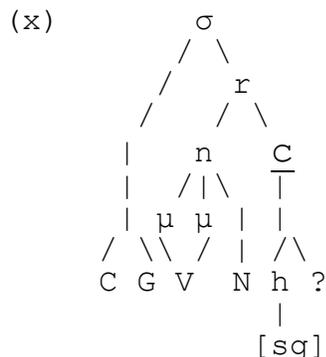
As just argued, rimes may contain glottal checking. Therefore, [sg] cannot be affiliated to this element of prosody in ballistic syllables.



[sg]

The Coda

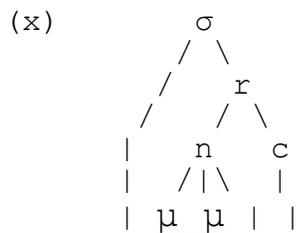
Ballistic syllables could conceivably involve [sg] associated to coda position, phonologically ordered with respect to /?/. However, in the case of glottally checked ballistic syllables, this would result in a highly marked branching structure involving a [sg] segment followed by a [cg] segment.



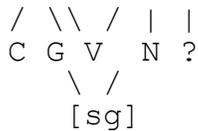
While the theory as stated does not categorically preclude the existence of such structures, there are good reasons to believe that this is the incorrect way to go. First, Chinantec has been argued to allow no codas other than /?/. If we now further allow /h?/ codas, we are claiming that a highly marked branching coda is acceptable, while other less marked branching (and non-branching) codas are disallowed. The markedness of this hypothesized coda type should not be underestimated: I am aware of no language in which this sequence of segments is permitted tautosyllabically.¹ That it should not only be permitted, but also be the only allowable branching coda in Chinantec, casts strong doubt on the present hypothesis.

The Mora

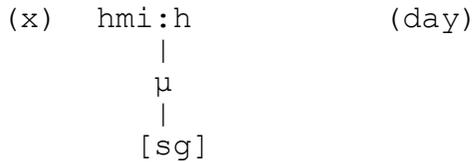
The affiliation of [sg] in ballistic syllables could conceivably be moraic.



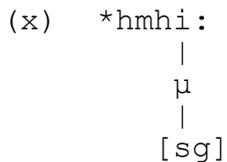
¹In Salish, it has been reported that form-final plosives are aspirated (...). There is ample evidence suggesting that this so-called aspiration is simply the fortis release of a glottal closure (Crook etc.) ...



This would provide a structural account of the shorter duration of ballistic syllable nuclei: aspiration attached to a second mora results in a monomoraic voiced vowel.



In bimoraic syllables, however, moraic affiliation predicts that contrasts between preaspirated and postaspirated syllables should be possible.



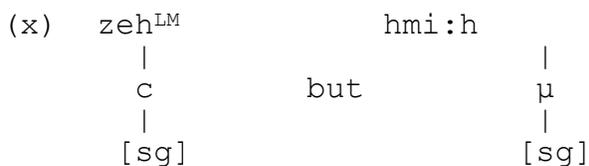
Such contrasts, of course, are unattested.

Further problems arise when considering the representation of monomoraic ballistic syllables.



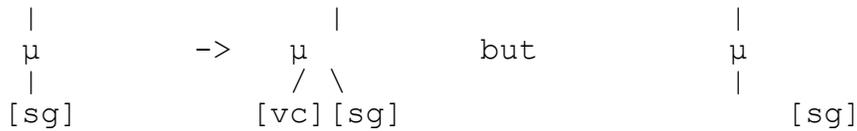
Such forms would seem to require either (a) associating aspiration to coda position in these forms only, or (b) aspiration associating to the sole mora, and thus aspiration is linearized with respect to vocalism in the phonetic component. Either approach is problematic, as we will now see.

If alternative (a) is accepted, an asymmetry results in that aspiration is moraic in long ballistic syllables, but non-moraic in short ballistic syllables.



Alternatively, if (b) is accepted, an asymmetry results in that aspiration is phonologically ordered in long ballistic syllables, but simply phonetically linearized in short ballistic syllables.



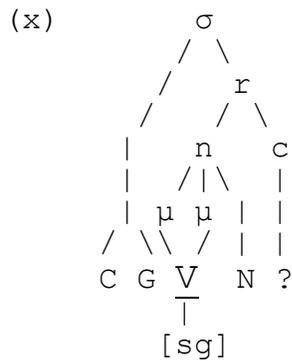


Thus either approach forces an asymmetrical treatment of long versus short ballistic syllables.

Given the problems of moraic association, this would not seem a hypothesis worthy of further pursuit.

The Segment

The segmental affiliation of [sg] in ballistic syllables will now be considered.



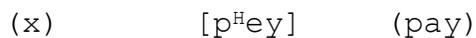
Allowing [sg] to associate directly to vowels would allow for further laryngeal contrasts in both onsets and codas. Thus onsets may be prelaryngealized, and syllables may be checked, both independently of ballisticsity. Further, as [cg] does not phonologically associate with vowels (i.e., there are no creaky vowels), no feature co-occurrence violation is encountered.

Finally, segmental affiliation correctly predicts the disallowability of moraic aspiration contrasts in bimoraic syllables.

There is a superficial problem with segmental affiliation, however. This does not explain the specifically *post-vocalic* realization of aspiration, nor does it explain devoicing (aspiration) of post-vocalic nasal glides in ballistic syllables.

If the phonological association of [sg] is segmental, it remains unexplained why its primary phonetic correlate, aspiration, should be realized on the following segment.

Upon further consideration, however, this phonetic realignment of [sg] may not appear so strange. In English, for example, aspiration, which under most analyses is phonologically associated to word- and stressed syllable-initial plosives, is phonetically manifested as vowel devoicing, or, in clusters, as sonorant consonant devoicing.



[pLey] (play)
 [pRey] (pray)

In such forms, both aspiration and the sonorant are assumed to occupy the Release position of the plosive, and thus are realized simultaneously (Kingston 1985, Steriade 1992).

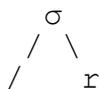
Assuming the segmental association of [sg] in ballistic syllables, with phonetic realignment, would seem a quite parallel situation to English aspiration. The major difference between the two situations is the structural specifications of the phonologically aspirated segment. While the English aspirates are plosives, the Chinantec aspirates are vocalic. This difference in stricture becomes crucial when recalling Steriade's (1992) hypothesis that while plosives are bipositional, continuants are monopositional, and thus cannot phonologically manifest featural contours. Further, recall that while Kingston has shown that phonetic linearization of laryngeal features associated to plosives results in enhanced phonetic salience (thus maintaining audible lexical contrasts that would otherwise neutralize), there has been no evidence indicating that laryngeally specified vowels pattern similarly. In fact, as will be argued in Chapter (x), laryngeal features phonologically associated to segments of lesser stricture do *not* seem to require phonetic linearization -- at least not to the same degree that plosives require -- in order to be perceived.

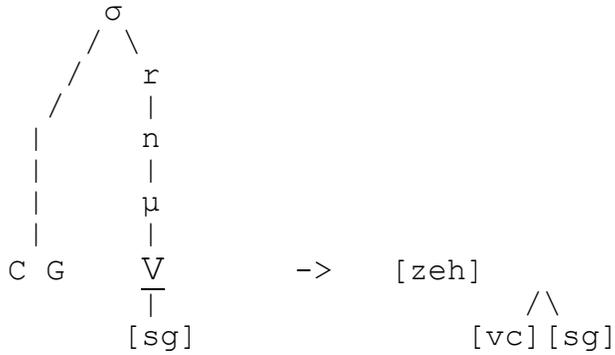
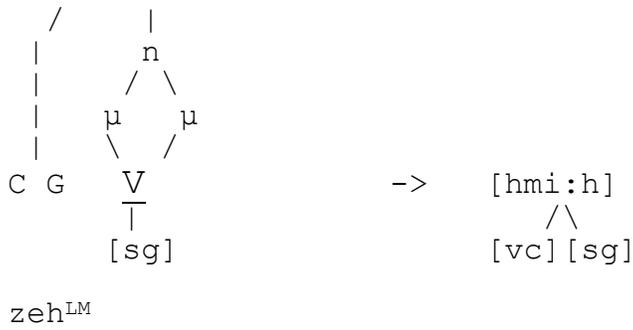
It would seem, then, that the segmental affiliation of [sg] becomes less plausible, as continuants disallow phonological contours, and as the perceptual salience of phonetic simultaneity in this instance is likely sufficient to maintain lexical contrasts.

There is, however, a crucial factor not yet considered in this discussion: Chinantec is a tonal language. While more full discussion of tone, phonation, and stricture interaction must await Chapter (x), I here anticipate one conclusion to be drawn: perception of tone is enhanced by modal voice in conjunction with minimal oral stricture. Conversely, perception of tone is reduced if phonetically co-occurring with non-modal voice and/or greater oral stricture.

When considering these anticipated conclusions, the hypothesis that the phonological association of [sg] is segmental in ballistic syllables becomes quite tenable. We will thus tentatively conclude that [sg] in ballistic syllables is phonologically associated with the nuclear vowel. Due to the phonetic requirements of tone perception, however, this aspiration is linearized at the phonetic level, so that all laryngeal contrasts may achieve a greater degree of phonetic salience. In (x) are a few phonological and phonetic representations.

(x) hmi:h





Conclusion

The [sg] specification in ballistic syllables phonologically associates at the segmental level. That is, the vowels of ballistic syllables are the phonological (though not phonetic) equivalent of "breathy voice". The stricture specifications of [sg]'s associated segment would not seem to require phonetic linearization of laryngeal features. However, vocalic modal voice is nonetheless manifested in order to enhance perception of tone, and thus [vc] and [sg] are linearized at the phonetic level. As noted, a fuller discussion of the interaction of phonation, tone, and stricture must await Chapter (x).