Against an ONSET Analysis of Hiatus Resolution

In Yatzachi Zapotec (YZ), spoken in southeastern Mexico, onsetless syllables are allowed initially, but input hiatus cannot surface in the output. In YZ derived vowel sequences hiatus is repaired through coalescence or diphthongization. The choice of repair strategy is dependent on the identity of the two vowels and their relationship to each other. Interestingly, vowel sequences in which the first vowel is followed by a glottal stop undergo processes that are remarkably similar to those that occur in strictly adjacent cases. Abstracting away from superficial differences, the same repair strategies take place in these environments as do in the VV contexts. Consider, for example, the data in (1).

(1)	**a.**	**zetSa + o?**	**→**	**zetSao?**	**-diphthongization**
	b.	**tSSagna? + a?**	**→**	**tSSagnao0**	**-diphthongization**
	c.	**zetSa + e?**	**→**	**zetSe?**	**-coalescence**
	b.	**tSSagna? + e?**	**→**	**tSSagnae0**	**-coalescence**

The similarity that exists between the Zapotec VV and V?V data suggest that they would be best accounted for under the same analysis. However, the data in (1) are problematic for ONSET analyses that claim that hiatus resolution is motivated by the need for every syllable to have an onset. While such an approach can handle the VV contexts, it cannot explain the repair of V?V, for faithful realization of the input would not violate ONSET. The failure of ONSET analyses to give a unified account of both phenomena illustrated by the data in (1) forces one to reject it.

Instead, I propose here that hiatus resolution may occur in a language quite independently of the ranking of the constraint ONSET. I approach the issue of Zapotec VV and V?V sequences under the framework of gestural phonology. In this framework, the phonological specifications of a segment are seen as instructions to the articulators regarding a specific target gesture associated with that segment. We can describe a gesture as involving movement towards the target, achieving the target, and movement away from the target. The precise descriptions of each of the gestural landmarks are given below in (2). (Gafos 2001)

(2)	**ONSET:**	**The onset of movement towards the target gesture**
	TARGET:	**The point in time at which the gesture achieves its target**
	C-CENTER:	**The midpoint of the gestural plateau**
	RELEASE:	**The onset of movement away from the target of the gesture**

Crucial to my analysis of the YZ data is Gafos (2001)'s notion of the coordination of gestures, and the claim that one can state the temporal coordination between gestures as a coordination of the landmarks of those gestures, his *gestural coordination relation*. Furthermore, the descriptive coordination relation can be translated into an alignment constraint governing the coordination of gestures.

In a gestural approach, the problem can be stated thus; faithful realization of input hiatus will result in an output in which the gestures of two vowels are adjacent or overlapping. During the transition from one vowel to the next, gestures are being made that do not reflect any underlying phonological specification, since only the target gesture for a segment is specified. Transitional gestures, then, are merely consequences of the physical system. During this period, acoustic cues are produced that the hearer must ignore to correctly perceive the speech stream; if he does not, he may incorrectly interpret the cues as being the result of an underlying gestural target. This situation is surely undesirable; by allowing gestures that are not part of the phonological specification of the word to be perceived, we are increasing ambiguity. In fact, it should be an overarching goal to obscure the acoustic realization of any gestures beyond the target one in order to avoid just this difficulty. Thus, ideally every sequence of vowels will be separated by a consonant that overlaps the transition between the two vowels. This requirement is formalized as a gestural coordination constraint that requires the release of the first vowel in a sequence to be aligned with the achievement of a consonantal target, and that the release of this consonant be aligned with the achievement of the

second vowel's target. In effect, the consonantal target must be aligned such that it entirely overlaps the vocalic transitional gestures. The constraint in question is shown below in (3).

(3) ALIGN (V_1, RELEASE, C_1, TARGET) & ALIGN (C_1, RELEASE, V_2, TARGET)

The constraint in (3) is high ranked in YZ, forcing repair of strictly adjacent vowel sequences. Note further, that this constraint requires the gestural TARGET of a consonant to be aligned with the flanking vowels. Thus, this constraint would also be violated by a VCV sequence in which the intervening C lacks an appropriate consonantal target. Following Steriade (1987) and others, I consider glottal stop in a non-guttural language like YZ to be placeless. Lacking an oral place target, therefore, YZ glottal stop cannot fulfill the requirements mandated by the constraint in (3). Consequently, the alignment constraint in (30 will equally be violated by VV and V?V sequences. Most importantly, this approach predicts the fact that repair will occur in V?V contexts, while an ONSET approach to hiatus resolution could not be extended to handle this data.

Finally, I extend my analysis to languages beyond YZ, showing that the constraint in (3), independently necessary to handle the Zapotec data, is at work cross-linguistically. I begin with Yucatec Maya, a language that requires vowels flanking a glottal stop to be identical, proposing that spreading is forced by the need to satisfy the aforementioned constraint:

(4) a. he? im b'ine? → hi? im b'ine? 'I will go' (Orie and Bricker 2000)
b. he? a b'ine? → ha? a b'ine? 'You will go'
c. he? u b'ine? → hu? u b'ine? 'He will go.'

Additionally, I extend the analysis to handle the Axininca Campa data shown in (5). AC resolves medial 'ONSET' violations, but not word initial ones. My analysis explains the asymmetrical treatment of putative ONSET violations without recourse to other machinery, since the constraint in (3) will apply only to cases of medial hiatus. Thus, ONSET may be ranked indefinitely low, with the proposed alignment motivating the repair instead.

(5) a. i-N-koma-i[1] → iNkomaTi 'he will paddle again'
b. oti-aanc^{h}I → otiTaanc^{h}i 'to put in" (McCarthy and Prince
c. i-N-tS^{h}ik-i → i¯tS^{h}iki 'he will cut' 1993)
d. *iraniri → iraniri 'his son-in-law'

I close with a discussion of further avenues of research that my analysis suggests, including research into feature spreading in vowel harmony systems.

Selected References:

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[1] For the purposes of these examples, N = a nasal unspecified for place that agrees with a following consonant in the output, **T**= an epenthetic coronal consonant.