ADJACENT IDENTICAL VOWELS: VOWEL LENGTH OR HIATUS?*

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1 Introduction

Languages differ in their treatment of what we can informally call adjacent identical vowels. The term "adjacent identical vowels" is purposely vague, and meant to encompass both literal cases of this (arising through morpheme contact, for example), as well as long vowels where there may be only one bundle of features, linked to two moras. The surface form of two adjacent identical vowels across a morpheme boundary shows a language's resolution of what must be two originally separate, now adjacent, identical vowels. Such a sequence may result in a long vowel (e.g. Blackfoot; Elfner 2005), hiatus (e.g. Belep; McCracken 2012), or coalescence/deletion (e.g. Meithei; Chelliah 1997).

(1) Examples of /V_i-V_i/ realizations[1]

Blackfoot	/ápɔkomi-iksi/	→	[á.pɔ.ko.miːk.si]	'horses with white neck markings'
Belep	/ju-u/	→	[ju.u]	'dig [detransitive]'
Meithei	/ʧá-hən-k^{h}i-í/	→	[ʧá.hən.k^{h}í]	'already caused to eat'

In some cases this resolution of vowels from different morphemes is the same as is found morpheme-internally. For example, Belep permits hiatus with all combinations of vowels, including identical vowels, and so the monomorphemic word [do.o] 'dirt' shows the same result as the resolution of two identical vowels across a morpheme boundary shown for the language in (1). On the other hand, while Blackfoot does have several processes to resolve hiatus, Taylor (1969) reports that in cases of intervocalic glide deletion, the resulting vowel sequence may either be said as a long vowel or may remain hetrosyllabic.

Morpheme-internally, it is more common for languages to realize adjacent identical vowels as long vowels, but we also find those in which the result is hetrosyllabic, resulting in hiatus. That is, a language can act like Quechua, which has contrastive vowel length and does not allow the configuration [V_i.V_i] (or indeed, hiatus more generally; Weber and Landerman 1985), or a language can act like Belep, which is argued not to have long vowels but permits the configuration [V_i.V_i] (and hiatus generally; McCracken 2012).

This paper looks at the case of two languages, Latin and Japanese, which allow both long vowels and hiatus with identical vowels, and proposes an analysis of the pattern in optimality theory (Prince and Smolensky 1993). Possible input and output structures are shown and discussed in §2. The contrastive syllabification of adjacent identical vowels in Latin and Japanese is shown and analyzed in §3, followed by the conclusion in §4.

*Thanks are due to Nick Kalivoda, Jen Smith, and Diana Worthen for helpful discussion, to Michael Covington for answering my questions relating to Latin, and to two anonymous reviewers for their constructive comments and suggestions. Any mistakes are my own.

[1] Examples taken from sources cited in paragraph above. IPA transcriptions have been standardized.

2 Adjacent identical vowels

Presumably, a long vowel (e.g. [Vː]) or hiatus (e.g. [$V_i.V_i$]) can result from either a single set of vowel features linked to two moras (as is generally assumed in moraic theory; Hyman 1985, McCarthy & Prince 1986, Hayes 1989) or two separate sets of identical vowel features each linked to its own mora. These two possible sources are shown in (2).

(2) Possible underlying sources for [Vː] and [$V_i.V_i$]

a. a single heavy vowel b. two identical adjacent vowels

Either of the underlying representations in (2) can result in either a long vowel or hiatus. The two possible surface structures for (2a) are shown (3), where the one vowel's two moras may be linked the same syllable or to two different syllables. The two possible surface structures for (2b), assuming no deletion of segmental content, are shown in (4).

(3) Syllabifications of [Vː] and [$V_i.V_i$] assuming (2a)

a. a long vowel b. hiatus

(4) Syllabifications of [Vː] and [$V_i.V_i$] assuming (2b)

a. a long vowel b. hiatus

Both possible outcomes, regardless of the variation between (3) and (4), are marked, and so the syllable structure will depend on the relative ranking of the markedness constraints *LONGVOWEL ("no long vowels") and *HIATUS ("no adjacent hetrosyllabic vowels"). Or, of course, both types of markedness could be avoided by deleting a mora (violating MAX(μ), and presumably also MAXV in the case of (2b)).

While we would not typically expect two see variation within a language between the long vowel and hiatus realizations, languages can contrast the two when more than one morpheme is involved.[2] I now turn to two such cases.

[2] In theory, a language could contrast vowel length and hiatus even monomorphemically, given the two possible underlying structures shown in (2), which is what Odden (1996) proposes occurs in Matumbi (also called Kimatuumbi) where the two forms are phonetically identical but the long vowel causes retraction of a following final high tone whereas the hiatus configuration does not.

3 Contrastive syllabic parsings

Both Latin and Japanese can contrast long vowels and identical-vowel hiatus. In the examples from Latin, the long vowel in (5a) is due to the genitive morpheme, and so the word is taken to be /me$_{\mu}$tu$_{\mu}$s - μ/ underlyingly. In the Japanese example, the long vowel in (6a) arises from a vowel that is heavy underlyingly (presumably /sa$_{\mu}$to$_{\mu\mu}$- ja$_{\mu}$/). The cases of hiatus with identical vowels in the (b) example of both languages, however, arise due to a morpheme boundary.

(5) Latin[3]

a. me.tuːs — 'fear (gen. sg.)'
b. mu.tu.us — 'mutual'

(6) Japanese[4]

a. sa.toː.ja — 'sugar shop'
b. sa.to.o.ja — 'foster parent'

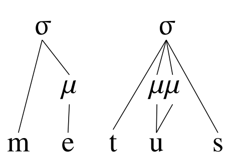
Because both languages have long vowels monomorphemically, we can deduce they prioritize the avoidance of hiatus, as shown in (7) for the example in (6a). (The input is shown with the assumption that long vowels have the form as in (2a), /V$_{\mu\mu}$/, as is the standard assumption under moraic theory, but the same result would obtain if the input had the form as in (2b), /sa$_{\mu}$to$_{\mu}$o$_{\mu}$- ja$_{\mu}$/.)

(7) Japanese (and Latin) preference for long vowels over hiatus

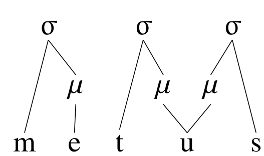
/sa$_{\mu}$to$_{\mu\mu}$- ja$_{\mu}$/	*HIATUS	*LONGVOWEL
☞ a. sa.toː.ja		*
b. sa.to.o.ja	*!	

The long vowel example in Latin given above is the result of the genitive singular morpheme adding a mora. The ranking *HIATUS ≫ *LONGVOWEL will also result in /me$_{\mu}$tu$_{\mu}$s + μ/ being realized with a long vowel, as shown in (11). The syllabic structure of the long vowel candidate (a) and the hiatus candidate (b) are shown in (8) and (9).

(8) Candidate (a) in (11)



(9) Candidate (b) in (11)



Two additional candidates are shown which either do not realize the genitive morpheme (candidate (c)) or link the mora of the genitive morpheme to the wrong vowel (candidate (d)). These candidates are ruled out by REALIZEMORPHEME (Kurisu 2001) and alignment of the genitive to the right (in the schema of Generalized Alignment; McCarthy and Prince 1993). (Right-alignment of the morpheme is taken to be satisfied in the optimal form here.)

[3]Thanks to Nick Kalivoda for the word in (a). The word in (b) is taken from Ito (2000:21).
[4]Examples from Vance (1987:14). Vance reports that there is disagreement whether the hiatus form in (b) is pronounced with an epenthetic glottal stop. Thank you to Jen Smith for drawing this pair to my attention.

(10) a. REALIZEMORPHEME: A morpheme in the input must be phonologically recoverable in the output

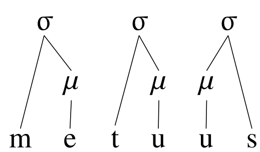
b. ALIGN (GENITIVE, RT; PRWD, RT): The right edge of the genitive must be aligned to the right edge of prosodic word

(11) Latin preference for a long vowel realization of a morphemic /μ/

		/me$_\mu$tu$_\mu$s + μ/	RM	ALIGN-GEN-R	*HIATUS	*LONGVOWEL
☞	a.	me$_\mu$.tu$_{\mu\mu}$s				*
	b.	me$_\mu$.tu$_\mu$.u$_\mu$s			*!	
	c.	me$_\mu$.tu$_\mu$s	*!			
	d.	me$_{\mu\mu}$.tu$_\mu$s		*!		*

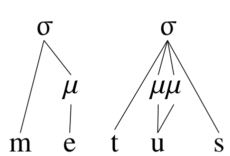
Turning to the forms in which we find hiatus of adjacent identical vowels in Latin and Japanese, we see that they result from a second vowel being introduced by a segmental morpheme. In these cases, there are two separate sets of vowel features. The optimal candidate will have the structure with hiatus in (12).

(12) Hiatus: optimal candidate (a) in (16)

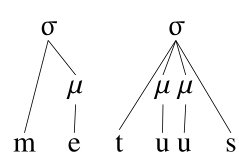


Both Latin and Japanese use this hiatus structure in despite both languages' preference for long vowels over hiatus. There are two possible long vowel candidates, one with deletion of one of the two vowels, and one in which both are parsed into the same syllable. These two alternative structures are shown in (13) and (14) for the word in (12).

(13) Long vowel: candidate (b) in (16)



(14) Long vowel: candidate (c) in (16)



While the structure in (13) would come at the cost of deleting a vowel, violating MAX ("no deletion"), there is no cost in faithfulness to the parse of both vowels into the same syllable, as in (14). This latter parse, however, can be seen to fail to align the edges of the morphemes to the edge of a syllable. We can see the difference between the preferred long vowel parse in Latin and Japanese and the actual surface form involving hiatus as a high-ranking preference for the edges of morphemes to be aligned to the edges of syllables. The alignment constraint in (15) is formulated to force alignment of the left edge of every morpheme to the left edge of a syllable. Ito and Mester (2015) observe a stronger requirement for Sino Japanese compounds, where both the left and right edges of the roots in such cases must align to syllable edges.

(15) ALIGN (MORPHEME, LT; σ, LT): The left edge of every morpheme must align to the left edge of a syllable

Taking this alignment constraint to be higher ranked than *HIATUS, we can rule out both long vowel candidates in (16). The alignment constraint would also rule out a coalescence candidate, *[me.tu:$_{i,j}$s].

(16) Latin (and Japanese) preference for morpheme-to-syllable alignment over avoidance of hiatus

		/me$_\mu$tu$_\mu$ + u$_\mu$s/	ALIGN-LEFT (MORPH, σ)	*HIATUS	*LONGVOWEL
☞	a.	me$_\mu$.tu$_\mu$.u$_\mu$s		*	
	b.	me$_\mu$.tu$_{\mu\mu}$s	*!		*
	c.	me$_\mu$.tu$_\mu$u$_\mu$s	*!		*

Thus we can understand the different parses of adjacent identical vowels in Latin and Japanese as arising from a preference for long vowels that is superseded by the preference for the alignment of morphemes to syllable edges.

4 Conclusion

Latin and Japanese present interesting cases of contrast in the syllabification of adjacent identical vowels. While the analysis presented here takes the underlying long vowel in the case of Japanese to orientate as a single vowel (bundle of features) with two moras, the ranking ALIGN-LEFT (MORPH, σ) ≫ *HIATUS ≫ *LONGVOWEL results in a long vowel in any case where there is not a morpheme to align to a syllable edge. This means that an input structure with two adjacent identical vowels, each with a single mora (corresponding to the structure of (2b)) would also map to a long vowel on the surface (either with both feature bundles in the nucleus or with them coalesced or one deleted).

It is not a coincidence that both Latin and Japanese prefer long vowels but chose the hiatus configuration in order to achieve morpheme-to-syllable alignment. A language that preferred hiatus (to long vowels) is predicted not to show a different pattern when morpheme edges are involved, as there is no possible push toward a long vowel specifically in this case. Thus we expect that languages will either act as Belep is described as doing, with hiatus of adjacent identical vowels both morpheme-internally and at morpheme edges, or as Latin and Japanese do, with long vowels morpheme-internally and hiatus at morpheme boundaries.

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