Vowel Dissimilation with Iambic Feet and Without Dissimilation

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Claim. A new account of vowel dissimilation is proposed, based on segmental fusion dependent on prosodic structure. This proposal, relying on the idea that languages show bias for the quality of the head vs. non-head vowels (cf. Beckman 1998; de Lacy 2006), accounts for the typological generalisation that regular vowel dissimilation is only found in co-existence with iambic feet.

The Phenomenon of Dissimilation as systematic avoidance of two similar segments adjacent at some level of representation was originally assumed to be the result of the *Obligatory Contour Principle* (Leben 1973, Goldsmith 1976). Later constraint-based approaches, such as *Generalised OCP* (Suzuki 1998), or the markedness-based approach by Alderete (1997); Ito and Mester (2003), have attempted to restrict the OCP to capture all the restrictions: domains of application, features involved, segmental blocking. As Bennett (2015) points out, all existing theories of dissimilation which employ a special rule / constraint family / case of constraint interaction either under- or over-generate. Furthermore, a typological survey of 66 languages reported to exhibit vowel dissimilation has shown that there are two main groups of dissimilatory effects on vowels: (i) morphological / irregular, as in changes in vowel quality occurring only in the presence of a specific (set of) morpheme(s), and (ii) phonological / regular, i.e. not morphologically conditioned. The latter kind is much more rare: 3/66 languages exhibit regular dissimilation of pre-tonic vowels (henceforth marked with boldface), and all of them are previously analysed as having iambic feet. Russian South Great dialects (East Slavic; Kuznetsova 1973; Davis 1970; iambic according to Halle & Vergnaud 1987; Melvold 1990; Crosswhite 2000; Nesset 2011) are well known for their 'dissimilative jakan'e', analysed by Suzuki (1998) as a case of polarity: /e, ɛ, a/ surface as [i] when preceding a [-high] vowel (/r'ek-/ 'river' ⟼ [r'**i**ká] N.SG), but as [a] when the following vowel is [+high] (/r'ek-/ 'river' ⟼ [r'**a**kí] N.PL). The change happens in a specific phonological environment, namely, apart from syllable adjacency, the alternating vowel is preceded by a palatal, and the trigger vowel is stressed. In Kera (Chadic; Ebert 1974, 1979; Pearce 2003, 2007*b*; Suzuki 1998), short /a/ surfaces as [ə] when followed by /a/ (/bàl-n/ ⟼ [b**ə̀**làn] 'love-me'). This alternation is blocked when the vowels are separated by more than one consonant (/fal-n-m/ ⟼ [falnam] 'find-PST-you.MASC'), when one of the two low vowels is long (/kaːs-ŋ/ ⟼ [kaːsaŋ] 'hand-yourPL'), and after laryngeals /h, ʔ/ (/hàm-m/ ⟼ [hàmàm] 'eat-you.MASC'). Finally, Woleaian (Micronesian; Sohn 1975; Sohn and Tawerilmang 1976; Suzuki 1998) exhibits iterative dissimilation of an underlying short /a/ to [e] when followed by /a(ː), ɒː/ (/yafara/ ⟼ [y**e**far̥e̥] 'shoulder'; /yafara-i/ ⟼ [yaf**e**rai̥] 'my shoulder'; /yafara-mami/ ⟼ [y**e**far**e**mami̥] 'our.EXCL shoulder'). Unlike the Russian dialects and Kera, the surrounding consonants have no effect on the change, although Woleaian has no consonant clusters to begin with. Common properties of all three genetically unrelated languages are that a. only short vowels preceding heavy syllables undergo the change, b. the change occurs only when the vowels would otherwise be identical, c. all three languages are argued to have iambic feet.

Dissimilation Without Dissimilation. The empirical generalisation on the co-occurrence of iambic feet and vowel dissimilation could be accidental, or it could be systematic. Contrary to earlier approaches to vowel dissimilation, I argue that this co-occurrence is systematic. Since it applies regularly to short non-heads of iambic feet, the observed alternation can be analysed with the same machinery as vowel reduction (cf. de Lacy 2006; Zec 2000; also Nesset 2011).

In Woleaian, the short low vowel is raised to [e] when followed by an /a/. The word-final vowel is assumed to be de-voiced by an independent process, giving rise to a word-final heavy syllable. Given Stress-to-Weight (Kager 1999), the heavy syllable is chosen as head, building an iambic foot at the right edge. If the Markedness Hierarchy had /e/ as the least marked vowel for non-heads, no other vowel would be expected to appear in this position. The feature [+low]

is therefore detached from the non-head. However, similarly to the strategy proposed in the framework of *Gradient Symbolic Representations* (Smolensky & Goldrick 2016, Zimmermann 2018), it can be fused with the feature [+low] of the head. I call this *Fusion by Identity*. In Russian dissimilative jakan'e there is an interaction between onset consonants and vowels in non-heads based on iambic feet and featural identity too: since the alternation only ever occurs with [-back] vowels and palatalised consonants, it could be assumed that the features of the non-head can be realised on the head, via fusion. The non-head vowel would remain [-back], as this is the feature it shares with the onset, and the residual features are epenthesised, giving rise to /a/ or /i/, but never /o/ or /u/. Pearce (2003, 2007*a,b*) provides acoustic evidence that iambic feet in Kera are constructed in such a way that the head syllable is obligatory heavy (underlyingly or derived via lengthening). The vowel of the non-head should preferably not be /a/, that is, should be of lower sonority. I assume a containment-based system (ESC; cf. Trommer 2011; Trommer and Zimmermann 2014; van Oostendorp 2008) with cycles of optimisation within strata, and autosegmental representations. If the FOOTFORM is specified as in (1), the form /bal-m/ is built at the STEM STRATUM – first an empty vocalic node is epenthesised, then vocalic features are copied from the underlying vowel, and then a disyllabic foot is assigned. In the case of /baaŋa/, the heavy syllable is chosen to be a head, and a monosyllabic foot is built, leaving a stray syllable on the right edge. Following Pearce, in (2f), I assume that the [-ATR] feature of the non-head /a/ is de-associated at the WORD STRATUM, and a [+ATR] feature is epenthesised. Note that in the system of ESC the de-linked features are assumed to remain as floats in the structure. I propose

(1) Possible foot structures in Kera

	(CVV)	(CVC)
monosyllabic		
disyllabic	(C**V**.CVV)	(C**V**.CVC)

that the feature [-ATR], once detached, is fused with the identical feature on the closest segment of the same morphological colour. Syllables with onset /h,ʔ/ block this type of fusion, additionally inducing a phonetic effect: unlike all other all consonants, laryngeals do not interact with tone in Kera (Pearce 2007*b*). This behaviour is in line with the typological finding that laryngeals phonetically lower adjacent vowels cross-linguistically. This can be captured with a high ranking of *+laryngeal,-ATR. However, data from Pearce (2007*b*) show that /a/ can be raised to [ə] also when preceding /i/, which points towards vowel reduction. The difference between e.g. Kera (VR) and Woleaian (VD) lies only in the ranking of MAX-F, violated & ranked lower in VR cases, satisfied with fusion when high ranked, in the case of VD.

(2) Kera head– non-head distinction

/baaŋa/		SWP	FootForm	$*{-}\Delta\phi \geq \{ə\}$	Δ_ϕMax[-ATR]	Align-R	Max-l
☞	a. (baa)ŋa					*	
	b. (bəə)ŋa				*!	*	*
	c. (baaŋa)	*!	*				
/bal-a-n/							
	d. (balan)			*!			
☞	f. (bəlan)						*
	g. bə(lan)			*!			*

Discussion. If there were however a rule against identical segments, then the co-occurrence of VD and iambs is accidental, which might also answer why no such restriction is attested for VR and syncope. I have shown that the co-occurrence of the two properties can be combined into an account that releases the grammar from a rule of dissimilation (thus going hand-ih-hand with Bennett's 2015 theory of *Surface Correspondence*). More importantly, it captures reduction and dissimilation as a unified process (similar to Nesset 2011), thus leading to a better understanding of these (as previously thought, non-related) phenomena. An implication of this account is that dissimilation should not exist as a mechanism in the grammar at all. This is not borne out in the case of consonants – as far as existing studies show (cf. Ohala 1981; Odden 1994; Bennett 2015; Suzuki 1998), consonants seem to require a true dissimilatory mechanism in the grammar.

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