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*VV in Hungarian

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Abstract

In Hungarian, suffixation derives robust instances of heteromorphemic vowel sequences (V_1+V_2). This work reports on an investigation of the facts (as culled, *inter alia*, from traditional grammars; Kenesei *et al*. 1998; Siptár & Törkenczy 2000; Siptár 2008) and provides analyses for the data within the framework of Optimality Theory. It brings together a conspiratorial web of mechanisms to respect a *VV constraint: V_1 deletion; V_2 deletion; suffix allomorphy. Exceptional cases are treated in terms of constraint reranking (Gouskova 2013). The main finding is that the story of vowel sequences across suffixes, not well studied in the phonological literature, as told from the perspective of Hungarian, provides strong support for Casali's (1997, 1998, 2011) model of hiatus resolution.

Key words

Allomorphy, constraint reranking, exceptionality, hiatus, Hungarian, optimality theory, positional faithfulness, vowel deletion

1. Introduction*

1.1. Goals

Hungarian V_1+V_2 vowel sequences have three surface manifestations. In the overwhelming number of cases V_2 deletes, in some cases V_1 deletes, while in others neither V deletes. We also observe the occurrence of allomorphy, through which VV clusters are avoided altogether.

My purpose in this contribution is threefold: (a) to make a contribution to establishing the facts of hiatus resolution in Hungarian; (b) to provide analyses for the data based on Casali's

(1997, 1998, 2011) pioneering work on hiatus resolution within the framework of Optimality Theory (OT; Prince & Smolensky 1993 [2004] *et seq*.);[1] and (c) to test the Casali model's predictions for hiatus resolution across suffixes. My overall goal is to establish the major patterns of hiatus resolution, rather than to provide an exhaustive account for individual suffixes.

1.2. Preliminaries

I will assume the following distinctive vowel system, given orthographically, with corresponding phonetic values:[2]

(1)	**SHORT**			**LONG**		
	i [i]	ü [y]	u [u]	í [iː]	ű [yː]	ú [uː]
		ö [ø/œ]	o [o]	é [eː]	ő [øː]	ó [oː]
	e [ɛ]		a [ɔ/ɒ]			á [aː]

Since the phonetic representations will not play a significant role in the data, for ease of exposition I will cite Hungarian forms orthographically.

In citations I will indicate, without further discussion, a broad phonological process that has only a few exceptions:[3]

(2) Low Vowel Lengthening (LVL): In morpheme final position, the low vowels *a* [ɒ] and *e* [ɛ] lengthen to *á* [aː] and *é* [eː], respectively, provided another morpheme follows.

Nor will I discuss the well-known and well-studied palatal and (un)rounding vowel harmony (VH) processes of the language, since they play no role in this work.[4]

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[1] For alternative treatments of the topic of vowel hiatus in Hungarian within the framework of OT, see Stiebels & Wunderlich (1999) and Siptár (2008).

[2] For discussion of the phonetic values of *ö* and *a*, see Szende (1994), Kenesei, *et al*. (1998), Siptár & Törkenczy (2000) and Vago (2006), among others.

[3] See the standard references cited above, as well as Vago (1978).

1.3. Background

It is well-known that VV sequences are generally avoided cross-linguistically. The conventional OT treatment of filling the hiatus between VV sequences is via a constraint called ONSET, according to which syllables that have an onset component are to be preferred. More recently, phonetic and psycholinguistic support has been adduced for the marked nature of VV clusters, which finds a more plausible explanation in terms of a NO HIATUS constraint than ONSET.[5] I will simply use the *VV designation.

There are various ways to resolve hiatus, among them vowel deletion, consonant insertion, glide formation, diphthongization, and coalescence (Casali 1997; 2011). For Hungarian, I will assume that hiatus is preferentially enforced by vowel deletion over the other possibilities through the judicious ranking of the relevant constraints. If VV survives through the phonology, then perceptually and articulatorily motivated hiatus resolution strategies kick in post-phonologically (see Siptár & Törkenczy 2000; Siptár 2002, 2006, 2008).

Following Beckman (1998, 2013, among others), I will assume that at certain morphological and phonological junctures segments are subject to positional faithfulness: At strong positions segments retain their distinctiveness and prominence. Beckman (1998, 2013), for example, argues that each of the following units enjoys phonetic or psycholinguistic prominence, and hence are defined as occupying strong positions, as opposed to their respective complements: root-initial syllables; stressed syllables; syllable onsets; roots; long vowels. In my proposed analyses, I will rely on the notion of positional faithfulness, coupled with MAX(imize) V constraints, which prohibit the deletion of prominent vowels (defined phonologically or morphologically).

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[4] For the broad details of the facts of VH, see, among many others, Vago (1980) (generative phonology framework); Kenesei *et al*. (1998) (comprehensive descriptive grammar); and Siptár & Törkenczy (2000) (autosegmental phonology framework).

[5] For details and references, see Casali (2011).

In Hungarian, like in many languages, there is an abundance of lexical roots that contain VV sequences. I assume that these VV sequences are rendered "untouchable" by a high ranking constraint (see fn. 15). Nor will I discuss V + V at Root + Root and Clitic + Root junctures. These concatenations are beyond the domain of our current interest.

2. Hiatus resolution: Root + Suffix

With the preceding serving as the relevant theoretical background, let us look at the hiatus resolution of Hungarian V + V clusters across root + suffix junctures.

2.1. V_2 deletion

As mentioned earlier, the most robust way to eliminate hiatus in $V_{1} + V_2$ clusters is to delete V_2. We find myriad evidence; the data cited here are merely representative. First, let's look at examples involving derivational suffixes: ([ ] = deleted V)

(3) a. -*ol* 'denominal verb'

szám ' number' *szám-ol* 'count'

pisi 'urine' *pisi*-[ ]*l* 'urinate'

b. -*os* 'denumeral noun'

hat 'six' *hat-os* 'the number six'

millió 'million' *millió*-[ ]*s* 'the number million'

For the analysis of general V_2 deletion across a root and a suffix, I will assume the following constraints, ranked in the general hierarchy in the order given:

(4) MAX LEX (Do not delete V in roots and content words.)

(5) *VV (Vowel sequences are disallowed.)

(6) MAX MI (Do not delete morpheme-initial V.)

For justification of MAX LEX and MAX MI, see Casali (1997, 2011), where these constraints are formulated so as to militate against deleting all lexical or morpheme-initial segments (C as well as V). Since here we are focusing on vowels, I will describe such generalized constraints as referring specifically to V.

Table 1 shows how the correct output is obtained in a typical case where a V-initial suffix is appended to a V-final root.[6]

/*hordó+unk*/ 'our barrel'	MAX LEX	*VV	MAX MI
hordó+unk		*!	
hord[ ]+*unk*	*!		
☞ *hordó*+[ ]*nk*			*
hord[ ]+[ ]nk	*!		*

Table 1: V_2 deletion in $V_{RT} + V_{SX}$

The second and third output candidates are immediately eliminated since they violate the highest ranked constraint. The first candidate is out because it violates the next constraint in the hierarchy. Out of the four possible outputs considered, the third one is optimal, since all alternative output candidates have been eliminated (notwithstanding the fact that the optimal candidate violates the lowest ranked constraint -- demonstrating that in OT constraints are violable).

2.2. V_1 deletion

In the case of a handful of suffixes (about 5), V+V clusters are avoided by deleting V_1.

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[6] For ease of reference, output candidates are shown with internal morphological structure.

This is conditioned only by specific derivational suffixes, which attach directly to roots. One such suffix is -*ász/ész*, used to derive names of professions. E.g.:

(7) a. *erdő* ‘forest’

erd[ ]-*ész* ‘forester’

b. *távíró* ‘telegraph’

távír[ ]-*ász* ‘telegrapher’

c. *szőlő* ‘grape’

szől[ ]-*ész* ‘viticulturist’

Suffixes like -*ász/ész* are exceptional and are treated as such: they are indexed to reorder the previously established constraint ranking, as indicated in (8).

(8) Constraint reranking for V_1 deletion

a. Regular hierarchy: MAX LEX » *VV » MAX MI

b. V_1 deletion hierarchy: *VV » MAX MI » MAX LEX

Demoting the relatively highly ranked constraint MAX LEX results in designating that output candidate as optimal in which the root final V is absent; see Table 2.

/*erdő* + *ész*/ ‘forester’	*VV	MAX MI	MAX LEX
erdő + *ész*	*!		
☞ *erd*[ ] + *ész*			*
erdő + [ ]*sz*		*!	
erd[ ] + [ ]*sz*		*!	*

Table 2: V_1 deletion in V_{RT} + V_{SX}

2.3. No deletion

A small, closed set of V-initial suffixes resist expected V deletion following a root-final V, giving rise to V+V clusters. This is the case with the adverb-forming suffix *-ul/ül,* used with names of languages: e.g., *eszperantó-ul beszél* 'speaks (in) Esperanto.' These suffixes are indexed for demoting the *VV constraint, as seen in (7b) and Table 3.

(9) Constraint reranking for no deletion

a. Regular hierarchy: MAX LEX » *VV » MAX MI

b. No deletion hierarchy: MAX LEX » MAX MI » *VV

/*eszperantó+ul*/ 'in Esperanto'	MAX LEX	MAX MI	*VV
☞ *eszperantó+ul*			*
eszperant[ ]+*ul*	*!		
eszperantó+[ ]*l*		*!	
eszperant[ ]+[ ]*l*	*!	*	

Table 3: No deletion in $V_{RT} + V_{SX}$

V-final adjectives exhibit three distinct patterns before an arbitrary set of V-initial suffixes (Siptár & Törkenczy 2000). Two such suffixes are the plural *-ak* /*ek* and *-an* /*en*, which derives adverbs from adjectives (see 10a). If the final V of the adjective is low, as in (10b), then suffix-initial V deletes, as expected; see the analysis in Section 2.1. If the final V of the adjective is high, as in (10c), then typically, neither V deletes. The analysis of such cases is akin to that of *eszperantó-ul* in Table 3: *VV is demoted. If the final V of the adjective is mid, as in

(10d), then typically two outputs are possible: one with VV (no deletion) and another only with V_1 (V_2 deletion). In these cases *VV is demoted optionally.

(10)	a.	*gyors* ‘quick’	*gyors-ak* ‘quick (pl)’	*gyors-an* ‘quickly’
	b.	*csúnya* ‘ugly’	*csúnyá-k* ‘ugly (pl)’	*csúnyá-n* ‘in an ugly manner’
	c.	*szomorú* ‘sad’	*szomorú-ak* ‘sad (pl)’	*szomorú-an* ‘sadly’
	d.	*bántó* ‘annoying’	*bántó-(a)k* ‘annoying (pl)’	*bántó-(a)n* ‘annoyingly’

2.4. Suffix allomorphy

Another leg of compliance with the avoidance of V+V leans on allomorphic variation in suffixes. Three such cases will be considered.

2.4.1. Deadjectival verbs

The set of V-initial suffixes that forces the deletion of a preceding root-final V (see Section 2.2) includes the deadjectival verbal suffixes in (11). However, at the junction of certain V-final adjectival roots and the three V-initial suffixes in (12) *s* appears, ostensibly to respect the *VV constraint. Contrast the two patterns (Siptár 2008:191):[7, 8]

(11)	a.	*barna* ‘brown’	*barn*[ ]-*ít* ‘make brown’
	b.	*laza* ‘loose’	*laz*[ ]-*ul* ‘become loose’
	c.	*szomorú* ‘sad’	*szomor*[ ]-*odik* ‘become sad’
(12)	a.	*olcsó* ‘cheap’	*olcsó-s-ít* ‘make cheap’
	b.	*állandó* ‘permanent’	*állandó-s-ul* ‘become permanent’
	c.	*forró* ‘hot’	*(fel)forró-s-odik* ‘become hot’

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[7] The identification -*s*- in (12) is cited from (Siptár 2008 and 2012); it has no analytical significance here.

[8] The denominal adjectival suffix -*i*,which does not undergo deletion (see Section 2.3), also patterns with the suffixes in (12) after certain nouns: cf. *falu* ‘village,’ *falu-s-i* ‘village dweller.’

The *s* that appears between the adjectival root and the suffix in cases like those in (12) is not epenthetic, as C epenthesis receives no independent support in the language (Siptár 2012). Recall from Section 2.2 that suffixes that induce V_1 deletion are analyzed in terms of being indexed for constraint reranking; see (8b). For cases like those in (12), these suffixes have an alternative way to avoid VV clusters: *s*-initial allomorphs.

The appearance of *s* is unpredictable. Nearly all the V-final adjectives undergo V_1 deletion before the suffixes in (11); the patterning in (12) is exceptional. In the regular cases V_1 deletion holds uniformly for the three suffixes under consideration; see for example (13a). The same is true for the exceptional (*s*-initial) cases, but in the case of at least one adjectival root one suffix induces V_1 deletion while another has the *s*-initial variant (Siptár 2012); see (13b).

(13) a. *tiszta* ‘clean’
tiszt[ ]-*ít* ‘make clean’
tiszt[ ]-*ul* ‘become clean’
b. *sűrű* ’thick’
sűr[ ]-*ít* ‘make thick’
sűrű-s-ödik ’become thick’

I submit that the irregularities discussed above are most appropriately analyzed in terms of context sensitive suffix allomorphy.[9]

2.4.2. Denominal adjectives

One way to derive adjectives from nouns is by adding the suffix -*(j)ú* /*(j)ű*. As a general case, the suffix is V-initial if attached to a C-final noun (14a), C-initial if it is attached to a V-final noun (14b):

(14) a. *hosszú láb* ‘long leg’ *hosszú láb-ú* ‘long-legged’
b. *jó forma* ‘good form’ *jó formá-jú* ‘well-formed’

[9] Siptár (2008; 2012) attributes the cases where the marked VV sequences are repaired by an intervening *s* to the analogical influence of an adjectival suffix that ends in *s*.

There is no motivation in the language to delete suffix-initial -*j* if preceded by C, as C-*j*V sequences are well-formed. E.g.:

(15) a. *vár-ja* '(s)he is waiting for it/them'

b. *kap-juk* 'we are receiving it/them'

c. *rúg-játok* 'you (pl.) are kicking it/them'

d. *nyom-ják* 'they are pushing it/them'

Hence, considering the *j*-initial variant of the suffix -*(j)ú* /(j)*ű* to constitute the input representation is not tenable. Rather, this suffix is analyzed as having two allomorphs, motivated by the *VV constraint.

2.4.3. Third person possessive

The third person singular and plural possessive suffixes have two variants following a morpheme ending in C: -*ja/je* or -*a/e* for the singular, -*juk/jük* or -*uk/ük* for the plural (see 16a, b). The presence or absence of the initial -*j* is conditioned, by and large, by the featural makeup of the preceding C (Siptár & Törkenczy 2000), though there is some measure of variability (Vago 1980; Siptár & Törkenczy 2000). For our purposes, the important point is that these suffixes always have the *j*-initial variant following V (cf. 16c). This is another case of suffix allomorphy, set up to obviate VV sequences.

(16) a. *bot-ja* 'his/her stick' *bot-juk* 'their stick'

b. *ház-a* 'his/her house' *ház-uk* 'their house'

c. *kapu-ja* 'his/her gate' *kapu-juk* 'their gate'

3. Hiatus resolution: Suffix + Suffix

Now we turn to V+V sequences that arise when a suffix ends in V and the following suffix begins with V. The most robust and transparent cases are found, not surprisingly, in the domain of inflection. In the case of derivation, I will consider only suffixes with high productivity and frequency, i.e. those that are the most transparent and least controversial analytically. Adjectives and adverbs have limited sequencing of suffixes. Hence, on the main, I will concentrate on verbs and nouns.

In Section 3.1 I exemplify V_2 deletion; I delay the analysis to Section 3.3. In Section 3.2 I provide data and analysis for V_1 deletion. I discuss no deletion cases in section 3.3. I will show that, as is the case with V+V sequences across root + suffix, V_2 deletion is the dominant strategy to resolve vowel hiatus and that V_1 deletion occurs only on an exceptional basis. I will further demonstrate the systematic nature of no deletion.

3.1. V_2 deletion

In verbs, derivational suffixation does not produce V+V sequences. Inflectional suffixation yields V+V when the conditional suffix is followed by a personal suffix. In these cases the initial V of a personal suffix deletes:

(17)	*hoz-ok* 'I bring'	*hoz-ná*-[ ]*k* 'I would bring'[10]
	hoz-om 'I bring it/them'	*hoz-ná*-[ ]*m* 'I would bring it/them'
	hoz-ol 'you (SG) bring'	*hoz-ná*-[ ]*l* 'you (SG) would bring'
	hoz-od 'you (SG) bring it/them'	*hoz-ná*-[ ]*d* 'you (SG) would bring it/them'
	hoz-unk 'we bring'	*hoz-ná*-[ ]*nk* 'we would bring it/them'

In nouns, V_2 deletion obtains between inflectional suffixes, as when a V-initial case suffix follows the V-final third person singular possessive suffix (18a) or when a V-initial possessive suffix follows the plural possessive suffix *-i* (18b):[11]

(18) a. *kapu-já*-[ ]*n* 'on his/her gate' (cf. *asztal-on* 'on (the) table')

b. *kapu-i*-[ ]*m* 'my gates' (cf. *asztal-om* 'my table')
kapu-i-[ ]*d* 'your (sg) gates' (cf. *asztal-od* 'your (sg) table')
kapu-i-[ ]*nk* 'our gates' (cf. *asztal-unk* 'our table')
kapu-i-[ ]*tok* 'your (pl) gates' (cf. *asztal-otok* 'your (pl) table')

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[10] In more formal style: *hoz-né*-[ ]*k.*

[11] For the non-deletion of the suffix *-i*, see Section 3.3

V_2 deletion occurs also between nominal derivation and inflection, as seen in (19):

(19) *nyomoz* 'detect'

nyomoz-ó 'detective'

nyomoz-ó-[ ]*m* 'my detective'

nyomoz-ó-[ ]*d* 'your (sg) detective'

nyomoz-ó-[ ]*nk* 'our detective'

nyomoz-ó-[ ]*tok* 'your (pl) detective'

3.2. V_1 deletion

There is only one suffix that instantiates resolution of vowel hiatus across suffix boundaries by deleting the first V. The infinitive suffix has an "inflected" usage, whereby it is followed by a possessive suffix that is marked for person/number. The full paradigm is given in (20) for the verb *tanul* 'study.'

(20) a. *tanul-ni* 'to study'

b. *tanul-ni-ja kell* 'he/she has to study'

tanul-ni-juk kell 'they have to study'

c. *tanul-n*[ ]-*om kell* 'I have to study'

tanul-n[ ]-*od kell* 'you (sg) have to study'

tanul-n[ ]-*unk kell* 'we have to study'

tanul-n[ ]-*otok kell* 'you (pl) have to study'

As seen, the infinitive suffix has two alternants: -*ni* in word final position (20a) or if a C-initial suffix follows (20b), -*n* if a V-initial suffix follows (20c).[12] The account of V_1 deletion across suffixes falls out of the already established constraint hierarchy in (8b) – without having

[12] In the third person forms (20b), suffix-initial *j* is pronounced, though it is not indicated in the orthography. The analytical move to include *j* in the input representations was first proposed by Siptár (2009).

to take into consideration the MAX LEX constraint, since root shape is irrelevant for present purposes:[13]

/*tanul+ni+unk*/ (*kell*) 'we (have to) study'	*VV	MAX MI
tanul+ni+unk	*!	
☞*tanul+n*[ ]+*unk*		
tanul+ni+[ ]*nk*		*!
tanul+n[ ]+[ ]*nk*		*!

Table 4: V_1 deletion in V_{SX} + V_{SX}

3.3. No deletion

Whenever V_2 deletion occurs (Section 3.1), V_1 is characterized as belonging to one of two classes. In the first case, V_1 is long and is immune to deletion:[14]

(21) a. /*hoz+ná+unk/* = *hoz-ná*-[ ]*nk* 'we would bring' (see 17)

b. /*kapu+já + on*/ = *kapu-já*-[ ]*n* 'on his/her gate' (see 18a)

c. /*Vargá+né + on/* = *Vargá+né +*[ ]*n* 'on Mrs. Varga'

[13] Siptár (2009) proposes to treat the alternations of the infinitive suffix in terms of allomorphy. The analysis proposed here in terms of constraint ranking was inspired by comments from two anonymous reviewers.

[14] For ease of reference, I include the effect of Low Vowel Lengthening (see 2) in the input.

It is well established that long vowels are privileged over short vowels (Beckman 1998, 2013). The following high level faithfulness constraint will protect the deletion of the long vowel in V_1 position in cases like those in (21):

(22) MAX V: (Do not delete a long vowel.)

In the second case of V_2 deletion across suffixes, V_1 is the sole exponent of a morpheme (it may be short or long) and is also resistant to deletion:

(23) a. /*kapu+i+unk*/ = *kapu-i*-[ ]*nk* 'our gates'(see 18b)

b. /*nyomoz+ó+u*nk/ = *nyomoz-ó*-[ ]*nk* 'our detective' (see 19)

For cases like this, Casali (1997) advocates the following constraint:

(24) MAX MS (Maximize monosegments (in morphemes).)

A monosegmental long V, as in (23b), is protected by both MAX V: and MAX MS. Both of these constraints are ranked high, dominating the chain of constraints already developed; the relative ranking between these two constraints is inconsequential in Hungarian.[15]

As a result of MAX V: and MAX MS, as well as the concatenative nature of Hungarian morphology, systematic cases of (multiple and continuous) surface V+V sequences abound. E.g.:

(25) a. Varg*á-né* 'Mrs. Varga'

b. Varg*á-né-é* 'that belonging to Mrs. Varga'

c. Varg*á-né-é-i* 'those belonging to Mrs. Varga'

d. Varg*á-né-é-i -é* 'that belonging to those belonging to Mrs. Varga'

e. Varg*á-né-é-i -é-i* 'those belonging to those belonging to Mrs. Varga'

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[15] The plural possessive suffix -*(j)ai*/*(j)ei* (post-consonantal allomorphs) induces V_2 deletion, even though its final V is short and not monosegmental morphologically: e.g. /*asztal+ai+unk*/ = *asztal-ai*-[ ]*nk* 'our tables.' What motivates V_2 deletion over V_1 deletion? I submit there are two things at play. One is derived environment effect (for discussion, see Burzio 2011) – that is, deletion does not break up morpheme internal VV sequences (the language has numerous lexical entries with VV). The other is *VV, which dominates MAX MI.

The data in (25) underscore the fact that a long V or a V that is the only exponent of a morpheme is protected from deletion in both V_1 and V_2 positions (excluding exceptional cases, such as those in 7).

4. Conclusion

We have seen that Hungarian employs a wide variety of strategies to avoid hiatus in V+V clusters in derived environments: across root + suffix and suffix + suffix morphological contexts. On the whole, these strategies follow a general, predictable path, with a dose of exceptionality thrown in for good measure. Undoubtedly, the most important results pertain to V+V sequences across suffixes. Here, in well-defined contexts, even the absence of resolving hiatus was found to be regular.

In Casali's (1997, 1998, 2011) treatment of vowel hiatus, there are no "MAX constraints that specifically target word- or morpheme-final position, or affixes or function words" (Casali 2011:1450), since these are not privileged positions, and as such they are not subject to positionally defined faithfulness constraints. On the face of it, the expectation for Hungarian is to elide the first vowel, since MAX MI protects the suffix-initial vowel.[16] But as we have seen, eliding the second vowel is the norm. In this light, it is noteworthy that Casali's proposed and well-justified constraint system makes just the right predictions in Hungarian. As such, this work lends strong support to Casali's theory of hiatus resolution.

It remains for future research to establish whether other agglutinative languages follow the Hungarian pattern – in particular, whether across suffixes V_1 is generally protected by MAX V: or MAX MS – and force V_2 deletion by the constraint mechanism set up in Casali's work. If not, a new constraint maximizing morpheme final V might need to be proposed and justified.

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[16] The corpora that form the basis of Casali's theory of how vowel hiatus is resolved come from languages that as a general case do not have suffix + suffix sequences.

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