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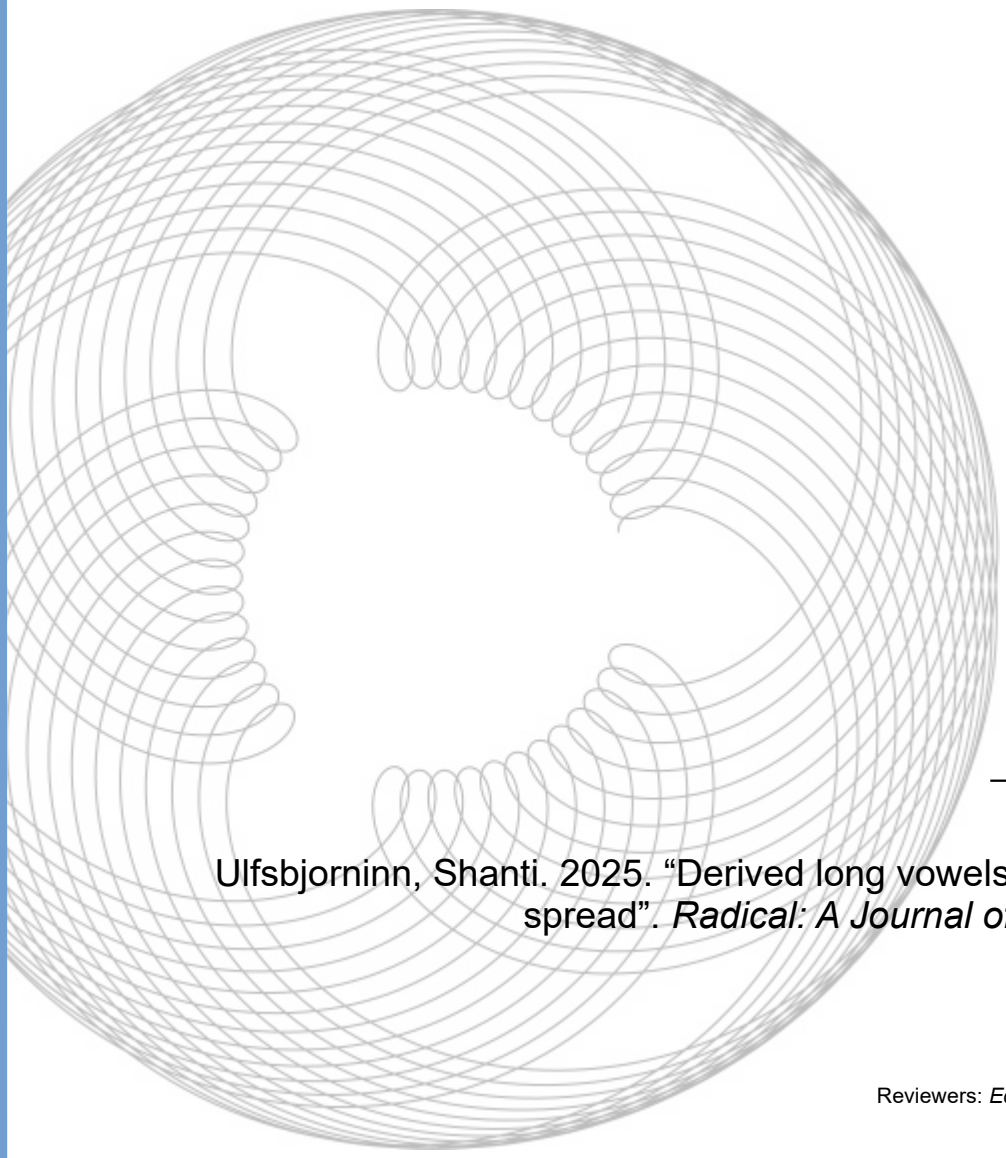

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PAPER

DERIVED LONG VOWELS IN PULAAR: LICENSE TO SPREAD

ULFSBJORNINN, SHANTI (MEMORIAL UNIVERSITY OF NEWFOUNDLAND)

Pulaar has both underlying and derived long vowels, but the derived long vowels cannot be formed in closed syllables (henceforth: VVCCV). This condition requires more than a simple surface ban on VVCCVs because underlying long vowels are permitted in this context. The problem falls within so called Derived Environment Effects (DEE). This paper, modelled in Strict CV, follows those who have argued that representations can help to make short work of DEEs. The difference can be hung on the fact that, unlike underlying long vowels, derived long vowels are demonstrably right-headed: (V1 + V2 > VV2). However, Pulaar still requires more than the tools currently available to Strict CV. Right-headed long vowels are generally assumed to be self-licensing, consequently they should be permitted in any context. The solution here, in analogy with Government Licensing (Charette 1990), is that - in addition to licensing the locus of spreading - there is also a licensing requirement on the head of a long vowel for it to form a new association line. This is called: License to Spread. In Pulaar, License to Spread can only be granted by a filled V-slot (again echoing the variation in Government Licensing). Some typological implications are discussed in the conclusion.

Keywords: Long vowels, Licensing, Derived environment effects, Parameter hierarchies.

INTRODUCTION

Pulaar is a sub-group of what has been called “Fula” but which has no unified autochthonous term (Diallo 1979:4). Various varieties of Pulaar are spoken across Mauritania, Senegal, The Gambia, Mali and Guinea. This paper looks at the data presented in Diop (1993), representing a variety spoken in Mauritania.

Pulaar has both derived and underlying long vowels. These are distributed freely in the language: [ɛːwnaːdɛ], [faliːma] and [kataː] ‘no gloss’ (Diop 1993:35). There are two sources of derived long vowels. The first involves the phonemes /h/ and /ʔ/, which delete in coda position and trigger vowel-lengthening.

(1) Derived long vowel (Diop 1993)

a.	mah-i	‘build-PST’	maː-de	‘to build
b.	fiʔ-i	‘beat up-PST’	fiː-de	‘to beat up’

The second source of derived long vowels is V+V sequences. These happen across various morpho-syntactic junctures. Pulaar has a V1+V2 deletion rule leading to the deletion of V1 and the spreading (compensatory lengthening) of V2.

(2) Vowel deletion and lengthening in Pulaar (Diop 1993:36)[1]

a.	sabu	-a	-jim	-at	[sab**a**ːjimat]
	because	-2PS	-sing	-ASP	
	‘because you sing’				
b.	ɓajri	-o	-jim	-at	[ɓajr**o**ːjimat]
	since	-3PS	-sing	-ASP	
	‘since he sings’				

[1] Other vowel-vowel sequences undergo gliding (a + e > aj) (see Diop (1993) for details). This rule does not apply across all syntactic boundaries. If it does not, a glottal stop is inserted. The full list of boundaries is given in Diop (1993:53-54). The details do not concern us since we examine the asymmetry of where vowel lengthening is permitted when the rule applies.

c. mali -e -moritani [mal**e**ːmoritani]
Mali and Moritania
'Mali and Mauritania'

Curiously, as we see in (3), this process applies only in open syllables despite the fact that VVCCVs are attested in this variety of Pulaar (and all other varieties known to me). VVCCVs are also attested across morpheme boundaries. Mauritanian Pulaar has: *ñoo**l-de*** 'to win', *loo**ɓ-de*** 'to smell bad' (Diop 1993:34). Niang (1997) reports: *joo**fn**u-de* 'to complete' as well as other similar forms. We see the following in Futaa Jaloo (Guinea): *paam-do* 'understand.PST.PTCL.SG', *kiir-do* 'spend the evening.PST.PTCL.SG' (Diallo 1979:12) *coo**nn**oo-Do* /coo**d + n**oo.../ 'the one who had brought' (Diallo 1979:18). The blocking of derived long vowel formation in closed syllables is shown beneath.

(3) Derived long vowels not possible in closed syllables

a. o -wiː -ko -on -ᵑɟah -iː [o-wiː-**kon**-ᵑɟah-iː] *koːn
3SG -said -that -2SG -go -ASP
'he said that you left'

b. o -wiː -ko -en -ᵑɟah -iː [o-wiː-**ken**-ᵑɟah-iː] *keːn
3SG -said -that -1PL -go -ASP
'he said that we left'

This state of affairs cannot be handled by a surface constraint banning long vowels in closed syllables for the simple reason that underlying long vowels are permitted in this configuration. Moreover, this cannot be remedied even by proposing new strata with their own ranking, at least not within a restrictive Stratal OT framework, where the only strata that can be proposed are stem, word, phrase (Bermúdez Otero 2010). This is because underlying VVCCV *is* allowed to exist across morpheme boundaries of all of these types. VVCCV is found mono-morphemically and across suffixes and between words: *joo**fn**u-*

de ‘to complete’ Niang (1997), *loo*ɗ*-**d**e* ‘to smell bad’ (Diop 1993:34). Since VVCCV must be allowed with affixes of any type, no constraint causing vowel shortening in closed syllables (call it *CVVC) can be highly ranked at either the stem level or the word-level, otherwise underlying long vowels at these levels would undergo shortening (or some other repair).

This problem falls within the realm of so-called Derived Environment Effects (DEE) (Kiparsky 1993). These are recognised as being tricky for OT specifically (Burzio 2000; Wilson 2000) and various mechanisms have been advanced to handle them. One approach significantly complicates the architecture of the derivation by allowing comparison of an output with another output (Burzio 1991 “consistency” and Output-Output faithfulness Benua (1997). This mechanism and its associated world-view has been shown to be directly falsified (Bermúdez-Otero 2018, and references within). Another approach, known as Sympathy Theory, allows the computation to reference other candidates within the same evaluation (McCarthy 1999). Though it is not immediately clear to me how this particular approach might be recruited to handle this Pulaar data, the other problems with the framework (highlighted by Bermúdez-Otero (2018)) make it a non-starter.

In another approach, Łubowicz (2002) uses a novel mechanism: Local Constraint Conjunction, ‘conjoining’ a markedness constraint with a faithfulness constraint. The result is a markedness constraint that is only active when the faithfulness constraint is violated. While this mechanism is undoubtedly clever, it is nonetheless obviated if a representational distinction exists already that can sufficiently explain the phenomenon. This is because representations are required anyway by phonology and are therefore there to be exploited, whereas constraint conjunction only exists to solve these types of problems.

One such representational approach is offered by van Oostendorp (2007)’s Coloured Containment theory. Each morpheme has its own “colour” that is a unique index that applies to all the representational content of that exponent, including all its segments, moras and association lines. This has the capacity to differentiate derived association lines from underlying association lines (see Zimmermann (2017) for a recent and extensive

application of this concept). This Coloured Containment version of OT would make short work of the Pulaar data discussed here. The limitation of this approach, however, is that colour is not an independently required object of the representation, so if there is an independent representational property to exploit, this will be a more parsimonious analysis. Nevertheless, van Oostendorp (2007) highlights the way in which a representational solution makes for a particularly elegant solution to this sort of problem. Kula (2008) pursues this in her paper on DEEs, showing that, for her cases at least, representations can handle DEEs in a simple manner.

This paper will follow this approach, invoking a representational difference between the underlying long vowels, which are all left-headed (V_1 + X → V_1:), as is standardly assumed to be unmarked in Strict CV (Lowenstamm 1996; Scheer 2004), and these derived long vowels that are demonstrably right-headed (V_1 + V_2 → V_2:) /sabu + a/ → saba: ‘because + 2PSG’). How this is modelled will be explained in the subsequent sections.

Before that, though, the interested reader might wonder why this representational solution could not be simply carried into standard, parallel OT; especially since richer representations are not in principle excluded by this framework (de Lacy 2002; McCarthy 2004; Iacoponi 2018). The problem is created by Richness of the Base, a central concept in OT that does not allow language specific restrictions on the input (Prince & Smolensky 1993). Since inputs cannot be restricted to either right or left-headed long vowel structures, the representational solution offered in this paper cannot be easily implemented in OT. For more on Richness of the Base and its implications for opacity see Rasin (2023). Government Phonology, Strict CV and related approaches make ample use of morpheme-structure constraints. In this paper, we will offer such an analysis. This will require adding to the theory’s understanding of LVlic.

Section 1 introduces the concept of LVlic as it is currently understood in Strict CV, and contexualises it with general licensing in phonology and Government Phonology more broadly. In this section, we will see that the facts of Pulaar require more than our current

understanding of either positional licensing or long vowel licensing. Section 2 then presents the novel aspect of the analysis: License to Spread. Section 3 then will ponder some typological consequences of the analysis. Finally, conclusions will be drawn.

1 LONG VOWEL LICENSING (LVLIC)

One unsung innovation of Government Phonology, and later Strict CV phonology, is the notion that there are two kinds of licensing. The first is inherited from older Generative Phonology, and it is the licensing of positions. Effectively, the permission of an *object* to remain part of the representation (Itô 1988; Steriade 1997; Kaye 1990; Charette 1990; Harris 1997). An example of this, abstracting from particular frameworks, could be licensing of a Coda. Where this object is not licensed, it would be removed in some way from the representation. The second type of licensing involves long vowels and, more recently, geminate consonants (Ulfsbjorninn, under review). This concept first appears in the GP literature in Yoshida (1993) and Kaye (1995) and is then further formalised in Scheer (2004) and expansively discussed in Ziková (2018). This second type of licensing is the licensing of spreading, that is, the permission of an association line to reach a second position (a.k.a. bipositonality); effectively a 'license to spread'.[2]

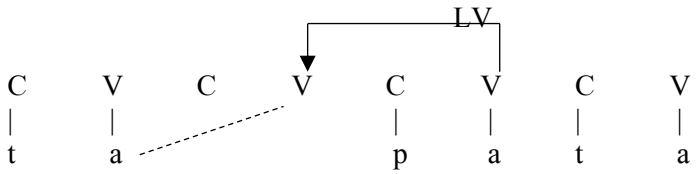
Central to this view on long vowels is the empirical observation that the critical environment for the distribution of VVs is what *follows* the VV. Counterfactually, one could have imagined a universe where in fact the environment to the left of the VV is what mattered. This counterfactual world would be one where long vowels are exclusively permitted if there is a singleton consonant to their left: CVVCV *CCVVCV. While such an isolated phonotactic is not exactly excluded, the systematic typology of VVs is clearly rightward focused, long vowels care about what follow them such as whether they precede a coda or not: CVVCV *CVVCCV. This is formalised in GP/Strict CV in the fol-

[2] For more conditions on spreading in a related but different approach see Yoshida (2023).

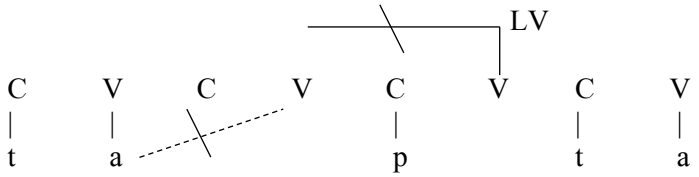
lowing way. The license is given to the position that hosts the spreading segment's association line, as shown beneath.

(4) Long vowel licensing (with hypothetical segments)

a. Long vowel licensing



b. No licensing, no long vowel



In Scheer (2004) and previous GP work, LVlic is understood to emanate exclusively from filled V-slots. However, cross-linguistically we know that long vowels can occur also in other syllable-structure configurations.

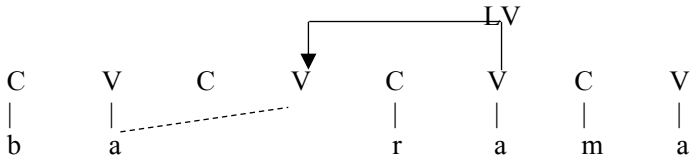
Balogné Bérces & Ulfsbjorninn (2023) expand on this LVlic potential and show that a coherent typology emerges if we assume that LVlic can come from either a filled or an empty V slot to the right. Indeed, these are in an implicational universal relationship: Empty V-slots can only Long vowel license if Filled V-slots can. Furthermore, this parameter can be set differently for final empty V-slots (FEN) and medial empty V-slots (MEN). This also appears to be in an implicational relationship, whereby MEN can only Long vowel license if FEN can also Long vowel license.

The various representational conditions that this typology constitute are shown beneath. We will show how it is restricted and formalised. The typological observation in (5) is well motivated and can be summarised as the conjunction of two properties: Filled > Empty & Final > Medial.

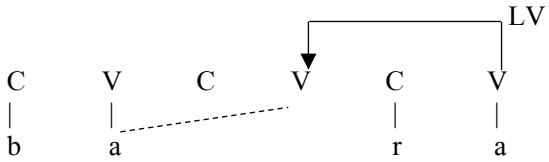
(5) Licensing VV

Filled > Empty, Final > Medial

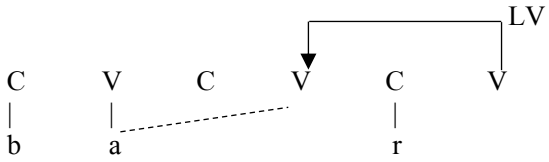
a. Filled Medial V-slot



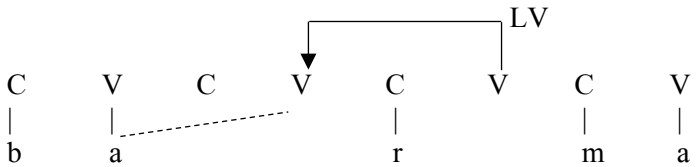
b. Filled Final V-slot (FN)



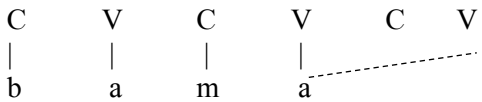
c. Empty Final V-slot (FEN)



d. Empty Medial V-slot (MEN)



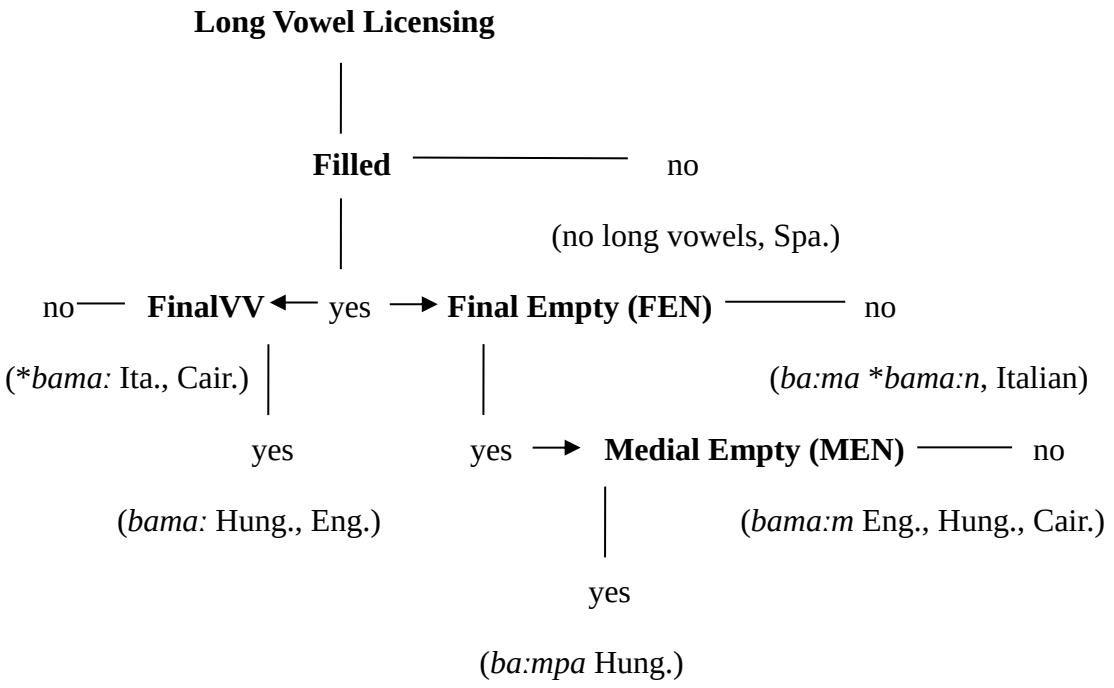
e. Final long vowels (the FN is part of the long vowel itself)



These representational configurations, and the LVlic they represent, are modelled with a parameter hierarchy (borrowed into phonology by Ulfsbjorninn (2017) from Syntax

(Baker 2001; Biberauer et al. 2013; Sheehan 2014)). The parameters are nested in a simple decision tree, so that the option of setting a lower parameter is contingent on the positive setting of a higher parameter. The hierarchy of parameters is fixed – it cannot be 'reranked' (Ulfsbjorninn 2017). This parameter hierarchy is presented here and then its properties are explained immediately below. It can be again seen as a formalisation of two independently attested hierarchies (cf. Perry & Ulfsbjorninn 2023): Filled > Empty & Final > Medial.

(6) Long vowel licensing parameter hierarchy[3]



We see in the above diagram that the nesting of LVlic parameters opens with Filled, meaning that a filled V-slot may long vowel license. If this is set to <no>, there will be no long

[3] Ita. = Italian, Cair = Cairene Arabic, Hung = Hungarian, Eng = English, Spa = Spanish.

vowels in the language (e.g. Spanish). If Filled is set to <yes>, then this leads to the consideration of two other parameters (independent from each other). The first, FinalVV allows a long vowel to spread into the absolute final position, the final V-slot (FN) itself. Languages with FinalVV set to <no> ban word-final long vowels (e.g. Italian), whereas if this parameter is set to <yes> word-final long vowels are permitted (e.g. English). The next parameter whose decision is contingent on Filled <yes> is Final Empty (FEN). If FEN is set to <yes>, then the language will allow long vowels before an empty V-slot, but only if this V-slot is final in the domain; languages like this are quite common (e.g. Cairene Arabic and English). Lastly, there is the MEN setting. This parameter is contingent on setting FEN to <yes>; as such, MEN <yes> can only be set if FEN is also set to <yes>. Languages like this are not common but robustly attested (e.g. Hungarian).

Generally speaking, the parameter hierarchy encodes the implicational relationships of the typology and also the markedness since the more positive <yes> settings that are required, the rarer the surface pattern they generate (Benz & Ulfsbjorninn 2018). Setting a parameter to <no> has no such effect. The rarest system (e.g. Hungarian) requires the most <yes> settings.

2 LICENSING DERIVED LONG VOWELS IN PULAAR

This licensing theory of long vowels will not be sufficient to handle the lack of lengthening that we saw in Pulaar. Pulaar does have CVVCCV sequences (MEN is set to <yes>); it thereby permits long vowels in both internal and final closed syllables.

Moreover, the derived long vowels that we are modelling in Pulaar are right-headed (at least that's the minimal assumption). An example of this is repeated below where we see V1V2 becoming VV2.

(7)	sabu	-a	-jim	-at	[sa**ba**:jimat]
	because	-2PS	-sing	-ASP	
	'because you sing'				

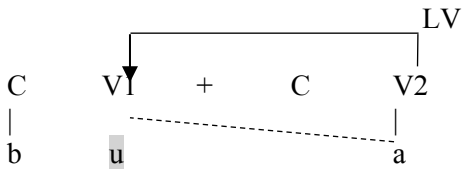
Since these derived long vowels are right-headed, they should have the capacity to act as self-licensors (Scheer 2004). This is because the locus of spreading (V1) is already in a licensable position (by V2) (see 8c).

(8) Self-licensing derived vowels

a. UR (the relevant portion only)

b. V1 deletion (hiatus shown with grayshading and a violation mark)

c. V2 spreading and LVlic (non-pronounced = greyshaded)



This means that these derived, right-headed, long vowels should be not subject to positional constraints, unlike left-headed long vowels that are subject to the shortening effects we saw in section 1.

However, this is not sufficient to account for the Pulaar data, since it does not distinguish between right-headed derived long vowels in open and closed syllables; both are predicted to exist, and we saw that the latter do not.[4] See an example below, repeated from earlier.

[4] The reader will recall that VVCCV are permitted in Pulaar across morpheme boundaries of all types, so this is also not the cause for the lack of lengthening in this context.

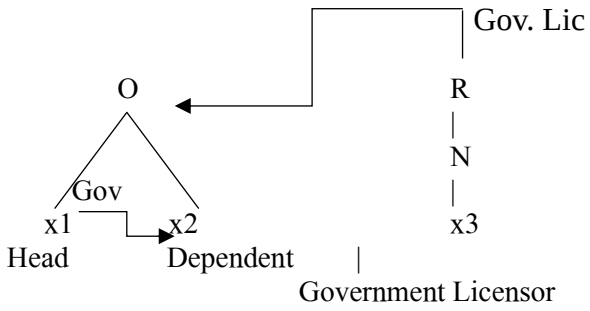
(9) o -wi: -ko -en -ᵑɟah -i: [o-wi:-**ken**-ᵑɟah-i:] *ke:n
3SG -said -that -1PL -go -ASP
'he said that we left'

In Strict CV terms, this means that derived long vowels are only permitted when the head of the long vowel is followed by a filled V-slot. Why should the derived long vowel care about the filled/empty status of a nucleus to its right? This filled/empty condition on a rightwards nucleus/V-slot of a head-dependent relationship (the V slots of the long vowel) is reminiscent of the manner in which another Government relationship (that of consonant clusters) is regulated in Standard Government Phonology (GP) (Kaye et al. 1990; Charette 1991). In Standard GP, consonant clusters require a form of positional licensing called (Trans-)Constituent Government. In branching onsets: [**br**æt] 'brat', /b/ (for example) governs /r/ and in a coda-onset sequence: [ɔ**rb**] 'orb' /b/ governs /r/ (Kaye et al. 1990). Charette (1990) adds to the theory of (Trans-)Constituent Government of Standard GP (Kaye et al. 1990) by noting that these government domains have a relationship with the filled/empty status of nuclei to their right. Charette hypothesises that the ability for a (Trans-)Constituent Government relationship to be established is granted by a nucleus to its right (for more work developing from this hypothesis see Cyran (2010, 2017); Ulfsbjorninn (2017); Cavirani (2022a, b)). This fits a more general principle that nuclei are the ultimate licensors in phonology (Harris 1994, 1997). This is shown schematically below.

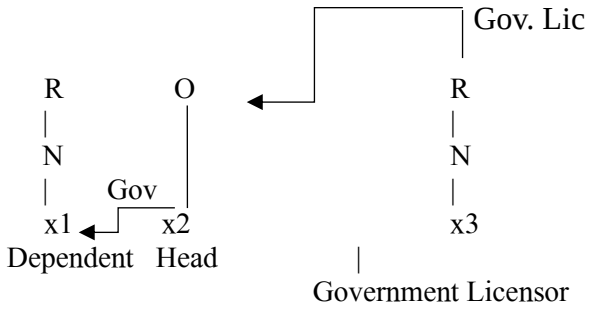
In (10), we see that a branching onset involves a constituent government relation between x1 the head and x2 the dependent and x3, the nucleus, provides the head the license to do so, so called: (Indirect) Government Licensing (Gov. Lic). A rime-onset cluster is shown also and it works in the same way, though the order of Head and Dependent in the cluster is reversed, this is referred to as 'direct' Gov. Lic.

(10) Government Licensing (based on Charette 1990)

a. Branching onset (indirect)



b. Rime-onset sequence (direct)



There are also further parameters, for example, final empty nuclei (FEN) are set differently to medial empty nuclei (MEN). Also the type of cluster matters, parameters can be set independently for the structure in (10a) and (10b). A full table of these Government Licensing parameters is shown beneath.

(11) Government Licensing Parameters (Charette 1992:289)[5]

Language	**MEN**[6]		**FEN**	
	Direct	**Indirect**	**Direct**	**Indirect**
Polish	yes	yes	yes	yes
Standard French	no	no	yes	yes
English			yes	no
Saint-Etienne French	yes	no	yes	?
Wolof			no	
Mongolian	no		yes	

We propose, in analogy with Government Licensing, that the formation of a new association line from a V-head (establishing a new Head-Dependent relationship) requires a License to Spread from a vowel to its right.

Another similarity with Government Licensing is that there is a condition on the licensing nucleus to be obligatorily filled. In Pulaar it appears that in order to form a derived long vowel (thus requiring the formation of a new association line and Head-Dependent relationship), not only does the locus of spreading (V1) need to be licensed (as explained in section 2), but the head of the right-headed long vowel (V2) needs to be licensed to spread and this *License to Spread* needs to be given by a filled V-slot.[7]

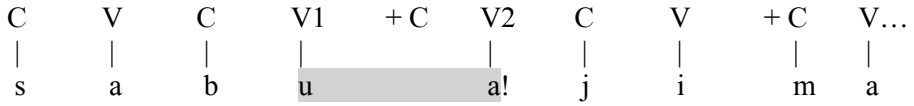
This is shown schematically in the following diagrams. The full derivation is shown starting with the underlying form which involves a V1+V2 hiatus (shown in 12a). This leads to delinking V1 (see diagram 12b). V2 is triggered to spread into the now empty CV that was previously hosting V1. Compensatory lengthening ensues. We see that these

[5] There is in fact a further similarity to the long vowel licensing discussed in section 2. The logic of Charette (1990) includes implicational universals – and is effectively a proto-decision tree/parameter hierarchy, for this interpretation of her parameters see Ulfsbjorninn (2017).
[6] Charette (1992) labels these columns *Properly Governed* and *Final Licensed*.
[7] Perhaps this License to Spread is literally License to Govern. Indeed, Yoshida (1993), who first discovered LVlic, conceived it in analogy to Government Licensing.

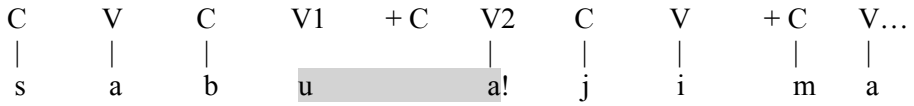
derived right-headed vowels are self-licensing but that their ability to do so is granted by the License to Spread issued from a filled V-slot (see 12c). Where Licensing to Spread is not issued, the derived long vowel cannot be formed and (presumably) the empty VC hosting V1 is deleted. The deleted structure is shown by being crossed out (12d).[8]

(12) Derived long vowels in Pulaar [sa**ba**:jimat]

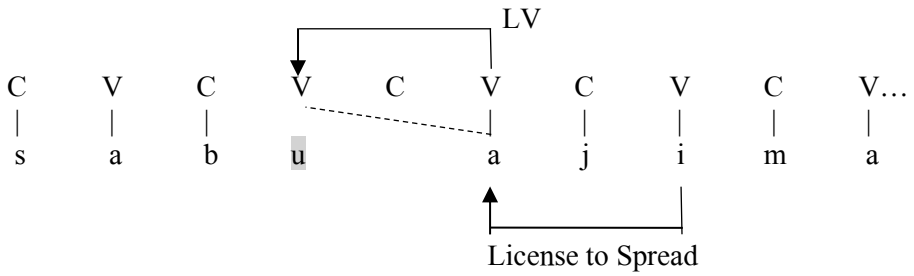
a. UR /sabu + a + ji + mat/ hiatus (shown greyshaded)



b. V1 delinking

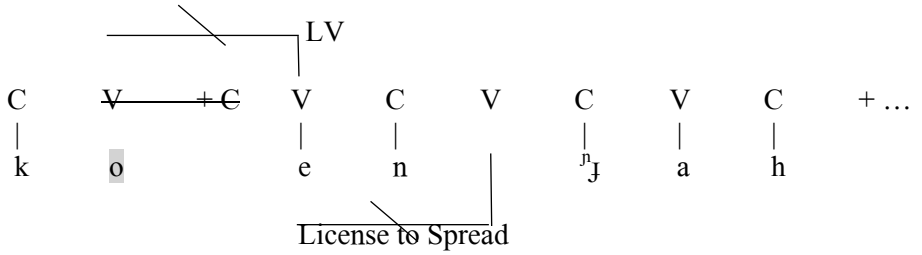


c. Compensatory lengthening



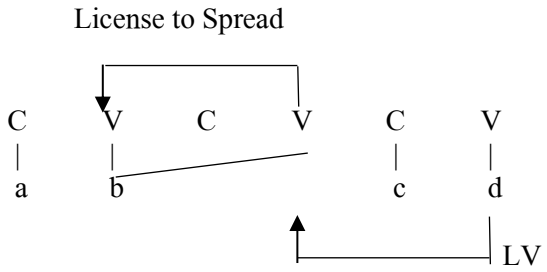
[8] There is a possibly language-specific or more general specification of 'repairs'. Gliding seems to be preferable to the formation of a new long vowel, and deletion is only a last resort strategy. Logically deletion could have 'worked' to repair any hiatus problem, however, this strategy is destructive whereas the gliding and long vowel formation leave a surface trace of the UR of the forms. It could be that the choice of repair is 'free' in a UG sense, and therefore it would need to specified in a ranking or rules (cf. Calabrese 2005), or, conversely, there could be a UG determined, natural, priority in repairs. The latter actually seems plausible, since I maintain that the most economical repair is gliding. Gliding does not require feature loss or loss of positions, all it requires is a change in association lines from V to C. Conversely, compensatory lengthening leads to the loss of features, as well as the establishing a new association line, while it retains the same number of positions. Conversely, deletion without gliding or lengthening would involve the loss of features and a change in the number of positions and association lines. We leave this as an open question for future research.

d. No License to Spread [o-wi:-**ken**-ᵑɟah-i:] ***ke**:**n**



The License to Spread condition may not be have been spotted before because the default structure for an underlying long vowel is left-headed; they can always automatically grant themselves the License to Spread (though they require the landing site of the long vowel to be 'long vowel licensed' from 'the outside' as explained in section (2)).[9]

(13) Left-headed vowel, License to Spread and Long Vowel Licensing



3 TYPOLOGICAL CONSIDERATIONS

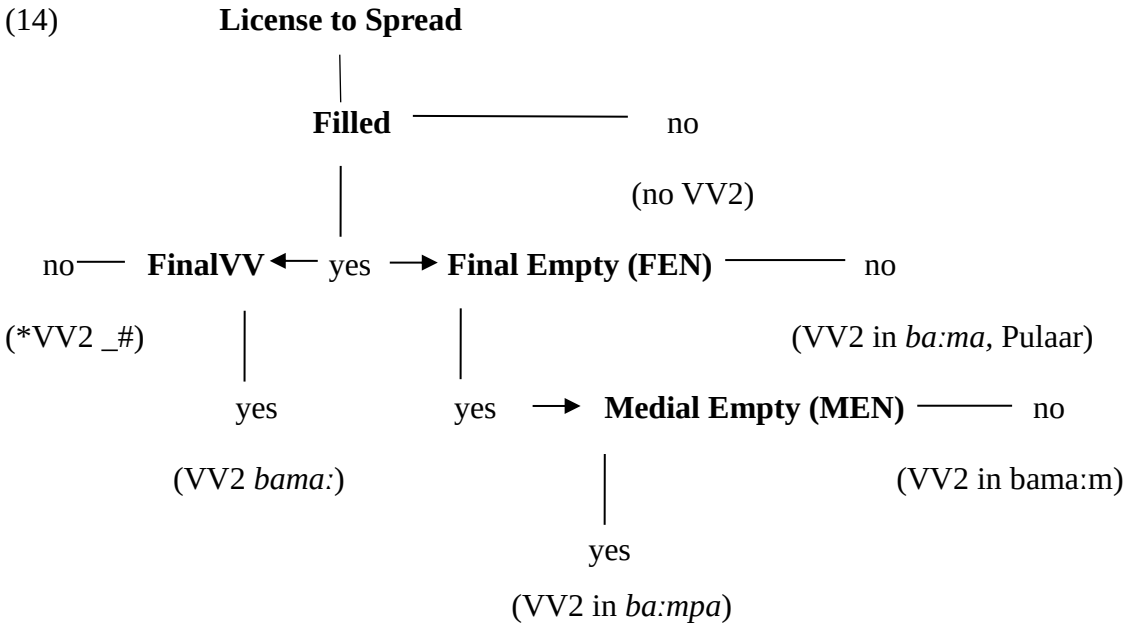
Since the License to Spread so closely resembles (and may even be a sub-type of) Government Licensing, it stands to reason that they should have a very similar or effectively identical parameter hierarchy. [10]

The Parameter hierarchy presented immediately below predicts a number of patterns, not all of which are already attested. It is, however, an intricate task to find languages

[9] Perhaps only *underlying* left-headed long vowels so transparently.
[10] This is especially the case since Government Licensing and LVlic share the underlying implicational relationships of Final > Medial and Filled > Empty (Balogné Bérces & Ulfsbjorninn 2023).

where constraints apply specifically to derived right-headed long vowels (rather than generalised to long vowels), so the types of languages are not fully exemplified, but they are predicted to exist by the model. These predictions are vacuous for derived left-headed long vowels. However, if the language has derived right-headed long vowels, the following systems can be expected. In the following VV2 stands for derived right-headed long vowels.

(14)



The first case is the easiest: if License to Spread is set to <no>, the language simply does not have any derived long vowels (though the absence of something is not easy to diagnose in phonology). One example though, might be Sawila (a non-Austronesian language of the Alor archipelago). Preliminary analysis of its stress pattern (Faust & Ulfsbjorninn 2024) suggests that the language is trochaic overall, but verbs, appear to have final stress (galí ‘pass to’). These can be unified if they actually end in an empty CV, which is the phonological exponent of a syntactic head (little v^0). This explains why even verbs have a trochaic nature when they are polysyllabic: (kálu) ‘bamboo lashing’, tukú = tu(kúCV)

‘peck’, tàtukú =(tàtu)(kúCV) ‘talk/tell’. However, this final empty CV does not trigger any lengthening of the vowel. The language does allow underlying long vowels: má:ni ‘to wear’ (these attract stress in any position: dá:kara ‘bamboo comb’, kawá: ‘shout’, but if this analysis is right, not derived ones.

If Filled is set to <yes> we are lead to the choice of two other parameters.
Of these two, if FinalVV is set to <no>, then the language will not allow derived long vowels in absolute final position (though the language otherwise allows underlying final long vowels). If FinalVV is set to <yes>, then derived long vowels will be allowed in this absolute final position.

Conversely, if FEN is set to <no>, the language will allow derived long vowels exclusively in open syllables. Pulaar is a language of this type.

If, however, FEN is set to <yes> this leads to the choice of a further parameter, MEN, if MEN is set to <no> then the derived long vowels will be allowed in ‘closed syllables’ but exclusively if they are word-final. This echoes the many languages that have long vowels in final closed syllables but not medial ones, though the condition should apply to derived long vowels, independently of the status of underlying long vowels in this position.

Finally, if MEN is set to <yes>, then derived long vowels will be allowed in non-final closed syllables. Because of the set-up of the parameters, if this condition is met the language allows derived long vowels in all other contexts (except absolute final position which is a separate parameter circuit).

CONCLUSION

In this paper we have seen that the typology of long vowels requires special conditions for derived long vowels, as opposed to only a surface-based condition on all long vowels. The difference is that with a derived long vowel, a *new* association line is formed. The ability for a vowel to do this only becomes apparent in a language with derived right-

headed long vowels such as Pulaar. Here we propose that the right to form a new association line is granted by a rightwards V-slot, akin to Government Licensing for consonant clusters. Crucially, the V-slot that grants a derived V-slot the right to spread must be filled. This is also a parametric setting of Government Licensing. Since the forces are so analogous, indeed they may be two versions of the same condition. We proposed the full typological space for derived long vowels. Future work will show whether this set of firm typological predictions is met or not.

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Discussion with Edoardo Cavirani
(KU Leuven)

Cavirani, Edoardo. 2025. Discussion in: Ulfsbjorninn, Shanti (auth). "Derived long vowels in Pulaar". *Radical: A Journal of Phonology*, 7, 1-31.

Introduction

The targeted paper introduces a couple of interesting technical innovations into the standard strict CV formal toolkit, i.e. the two kinds of licensing mechanisms dubbed 'Long Vowel Licensing' (henceforth LV) and 'Licensing to Spread' (henceforth LS). As suggested by the author, the latter is reminiscent of GP Government Licensing, inasmuch as both allow the object they target to establish a relation with another object. As for LV, is was in fact already introduced by the author in previous work (Balogné Bérces and Ulfsbjorninn 2023), and is further discussed in the present paper, where its interaction with LV is discussed.

The paper presents an adequate formal analysis of the Pulaar data considered. At the same time, the introduction of these mechanisms raises larger questions and gives us the chance to discuss a couple of technical aspects of strict CV that I think have not been adequately addressed in previous literature, nor in the present paper. These aspects concern the interaction of strict CV mechanisms/principles/conditions/constraints. One aspect is whether these mechanisms/principles/conditions/constraints (I henceforth just refer to constraints) must be thought of as applying i) in a sequence, which would imply the generation of a set of intermediate forms filling the space between UR and SR (and, relatedly, whether the sequence is universal or language-specific), or ii) all at once to the UR, which would possibly point towards an OT-like architecture where many SR forms

are generated, evaluated against such constraints, and selected in such a way that the winning SR incurs the least number of violations. Moreover, this would clearly imply that at least some of these constraints are violable. Alternatively, one might prefer to increase the level of detail of the structural description of these constraints in such a way that they apply to very specific objects. This increase in constraints complexity would clearly result in an increase of the number of constraints, which is the second point I would like to briefly discuss in relation to the proposed LV and LS. In general, I would like to suggest that this move towards the increase of the complexity and number of constraints is possibly not such a good idea, especially within a generative approach that, if anything, has witnessed a constant decrease in condition complexity at least since GB (Chomsky 1981). As I think these are rather general issues, whose discussion would possibly require several papers, I limit myself to relating them to the content of the targeted paper, and hope that this will spark some further discussion.

On the sequential *vs* parallel nature of strict CV constraints

My point regarding the sequential *vs* parallel nature of CV constraints was triggered by the discussion of the licensing of long vowels. While discussing its status in GP-based models, the author refers to Yoshida (1993), Kaye (1995), Scheer (2004), and Ziková (2018), but I think that Larsen (1998) work should also be considered, for this triggers some potentially interesting conflict between the LV and Proper Government. In a paper of mine (Cavirani 2022, fn5), I report an excerpt of it, where I note that "for Larsen (1998)'s hypothesis to hold [namely that long vowels must be licensed by a following full V position], we need to order the spreading operation responsible for the lengthening of the stressed V before the discharge of the lateral forces of the following V. This might not be a trivial issue for several reasons. Let us consider an example from Italian, e.g. [ˈkaːsa] 'house'. Under relatively standard assumptions, the derivation of this form

starts from the selection of the root /kas_/, which is then merged with the gender and number heads, realized by /-a/ if their values are feminine and singular [...] In strict CV, the root /kas-/ is represented as a CVCV string with a final empty V, and /-a/F.SG as a floating segment (Lampitelli 2010, Passino 2009). Given that the Italian stress assignment algorithm places the stress on penultimate vowels, and that this algorithm can only see full V nodes, the stress gets assigned to the first V node of /kas_/ only after the floating /a/F.SG associates to the final empty V node of the root. Thus, we would have /kas_/+ /a/F.SG → /kasa/F.SG → /ˈkasa/F.SG. According to Larsen (1998), when the stressed V is in an open syllable, i.e. when it is followed by a full V, the extra empty CV responsible for the lengthening of the stressed V is introduced. We would thus have /ˈkasa/F.SG → /ˈkaCVsa/F.SG. Note that at this point the extra V is i) empty and ii) followed by a full V. Thus, the latter could in principle govern the former, keeping it silent, thereby yielding *[ˈkasa] [...] For the system not to generate the wrong forms, we necessarily have to maintain that [either] the melodic content of the stressed V fills in the extra V provided by stress *before* the final full V discharges its governing force [or that LV outranks proper government.] Only in this case, the final V's government force can spare the preceding V".

As far as I can see, this issue of timing shouldn't be underevaluated by scholars focusing on the theoretical properties of strict CV, as the solution one wants to adopt has clear consequences on the success of analyses, as well as on the plausibility of proposed constraints. However, to the best of my knowledge, the discussion of this issue has not found a lot of space in the literature yet. To the best of my knowledge, something explicit on that has been claimed only by Scheer and Cyran 2018, where government is said to take precedence over licensing. However, no clear argument has been proposed supporting this hypothesis, and I would hope that the targeted paper - which explicitly deals with LV without considering the interaction with other constraints targeting other VV sequences, e.g. those regulating when we have spreading and when we rather have

V1's melodic content deletion (hiatus resolution via V1 deletion is possibly beyond the purview of the targeted paper, which only focuses on long vowels - will provide us with the opportunity to discuss this and similar questions a bit more seriously.

On the number of strict CV constraints

Besides LV, the paper introduces LS, which is modeled on Charette's Government Licensing. For his analysis, the author seems to need both, but I wonder whether this is really the case. Taking the comparisoin with Charette's work a step further, we could distinguish between two kids of LS, i.e. direct and indirect LS. The former would be discharged by a full V onto its left-adjacent V, whose melodic content would thus spread onto the preceding V (leftward spreading), whereas the second would be discharged by a full V onto the second left-most V node, whose melodic content would then spread to the following V node (rightward spreading). This would allow for an analysis where Pulaar has the direct version of LS, whereas languages having rightward spreading (e.g. Italian) would have the indirect version. More importantly, if one assumes that only full V can discharge LS, we could do without LV, which means making our toolkit a bit lighter and, crucially, doing without a constraint that comes with the potential problems discussed in the previous section.

Clearly, one would like to derive the difference between direct and indirect LS from some other independently needed assumption, but this is not an impossible endeavor, as the direct-indirect asymmetry could be possibly linked e.g. to constituency, level of projection in a metrical grid-like representation, or perhaps melodic complexity (in cases where one and the same language has both direct and indirect LS). Further work might shed some light on this issue and possibly provide more arguments for approaches requiring less (complex) constraints.

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Discussion with Sören E. Tebay
(Universität Leipzig)

Tebay, Sören E. 2025. Discussion in: Ulfsbjorninn, Shanti (auth). "Derived long vowels in Pulaar". *Radical: A Journal of Phonology*, 7, 1-31.

Comments

In describing, analyzing, and discussing the ban on derived long vowels in heavy syllables in Pulaar, this paper makes both an important empirical and a significant theoretical contribution on interaction in phonology. Empirically, it describes a phonologically derived environment effect, a phonological pattern that has been argued to be rare. On the theoretical side, it proposes a representational analysis that crucially allows for a systematically different representation between underlying and derived long vowels. I will discuss both contributions separately in the rest of this comment.

Phonologically Derived Environment Effects (pDEE), such as the ban on long derived vowels in closed syllables in Pulaar, are relevant because they pose a challenge to many theories of phonology. Such patterns are relatively rare (Tebay & Zimmermann 2020:39), and some of the cases have been reanalyzed or reinterpreted (Hammond 1992; Jukes 2006). This paper adds another clear case of pDEEs to this list, more specifically, a case where the target of a phonological process, in this case shortening, is only affected if it is derived by another process, in this case vowel coalescence. This pattern is also special in that it looks like the shortening partially undoes the effects of coalescence, namely creating a long vowel. This means that a possible reinterpretation could instead assume that two separate processes apply in different environment. Coalescence resulting in long vowels could apply in open syllables and vowel elision resulting in

short vowels could apply in closed syllables. Several possible versions, e.g. involving coalescence, vowel elision, compensatory lengthening, and/or vowel assimilation, are conceivable but all of these run the risk of missing the obvious generalization that these two processes only differ in the resulting vowel length. It remains to be seen if future research could distinguish between the two interpretations.

Apart from the proposal of a new kind of licensing for Government Phonology, the presented analysis also involves another theoretical contribution, which is independent of this particular framework. It shows that pDEEs can be modeled with a representational difference between derived and underlying targets (see Rasin (2023) for a similar approach). This crucially requires an explicit restriction on underlying forms: underlying long vowels need to have one headedness direction, either universally or specifically in Pulaar. This question directly touches on discussion of the Richness-of-the-Base principle in the literature on Optimality Theory, which bans at least language-specific restrictions on URs, as the Pulaar pattern constitutes a Richness of the Base Problem in the sense of Tebay (2022:144). This also relates to the typological predictions made in the paper. The paper extends implicational parameter hierarchies for underlying vowels to derived vowels by seperating them into right-headed and left-headed vowels. This mapping only works as a prediction if the restriction on underlying vowels (and a restriction on derived vowels) are universal properties. If these restrictions are language-specific, the prediction loses its generality and its testability.

Interestingly, if the restriction is universal, this would make the theoretical contribution compatible with what the paper calls "restrictive models of OT" since Richness-of-the-Base only bans language-specific restrictions on underlying vowels. Nevertheless, such an approach would add additional information to a purposed Universal Grammar in Generative Phonology, which might be objectionable for defendants of a slim UG. Such an assumption would also mean that differences in headedness could not be used to explain lexical differences between different kinds of long vowels in a specific lan-

guage, since all underlying vowels would be uniform in their headedness. Under the assumption that the restriction is language-specific, the approach would require so-called "restrictive models of OT" to give up Richness of the Base. The data are, however, derivable in orthodox Optimality Theory (Prince & Smolensky 1993), which proposed Constraint Conjunction (Lubowicz 2002), for independent reasons related to the typology of markedness constraints, and in standard versions using value-specific Ident constraints (Hall 2006). It remains to be seen if the stronger — universal — version of the theoretical contribution of this paper can be upheld or if the weaker — more language-specific — version is needed.

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