Getxo Basque CC Repairs: Optionality, Counterbleeding and Substance Free Phonology

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Abstract

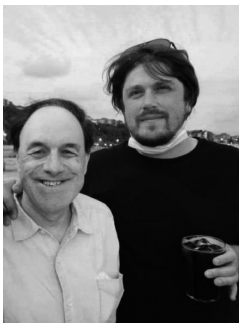
In Basque varieties many consonant-consonant nexuses are formed at the boundary between affixes and words. Many languages have generalisations that apply to consonants that become adjacent in this manner, we will refer to these as 'repair' strategies.[1] At the time of its description (Hualde & Bilbao, 1992), Getxo Basque had some optionality in its C1C2 repair strategies, these include either consonant deletion counterbleeding devoicing, or voicing and spirantisation, or partial deletion. Each strategy is itself phonologically interesting, and we will describe its mechanisms and comment where relevant on their phonological significance. Within the voicing framework of Laryngeal realism, we will propose that Getxo is an H-language, and all the voicing interactions will be shown to proceed transparently. The difference between the two main strategies of C1C2 repair is that the former creates phonological gemination, while the latter does not.

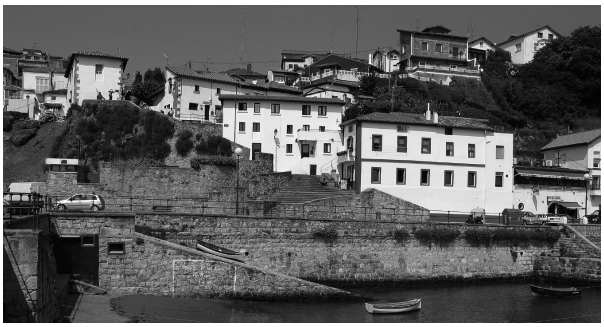
[1] Without any implications being drawn from the term.

1. **The phenomenon and its optionality**

Getxo Basque is a Bizkaian dialect spoken in Getxo, a town situated on the right side of the mouth of the Nervión river, fourteen kilometres north of Bilbao in the province of Biscay, in the Basque Country of Spain. Though it retains a distinct identity, the town is currently part of the Greater Bilbao metropolitan area.

(1) Jon Franco & Shanti Ulfsbjorninn in Portu Zaharra, pictured right (Getxo)





The inventory of Getxo Basque is given beneath.

(2) Consonants

p	t		k
b	d		g
f	s	ʃ	x
	ts	tʃ	
m	n	(ɲ)	
	l	(ʎ)	
	ɾ		
	r		

(3) Vowels

i		u
e		o
	a	

All consonants except for [ɲ, ʎ] and [ɾ] are permitted word-initially. The former are not found in this position because they are in fact derived by palatalistion in Hualde & Bilbao (1992:7), see Balogné Bérces & Ulfsbjorninn (to appear) for a more nuanced recent account, while the latter is not found initially because its distribution is limited to being intervocalic (Hualde & Bilbao, 1992:8).

Word-finally, Basque allows the following consonants: the sonorants [n, l, r] and obstruents: [s, ts, tʃ, t, k] (see 4 below), and the consonant clusters exemplified in (5) (Hualde & Bilbao, 1992:13-14). The cluster /rk/ undergoes r deletion: /nor + k/ > [nok] 'who.ERG' (cf. /nor – Ø/ [nor] 'who.ABS').

(4)			(5)		
	bat	'one'		bost	'five'
	gisonak	'the man.ERG'		bart	'last night'
	arnas	'breath'		ants	'resemblance'
	ots	'cold'		balts	'black'
	gatʃ	'difficult'		burukorts	'head-pin'
	gison	'man'			
	sabal	'wide'			
	tʃakur	'dog'			

Relevant to our ensuing conversation, unlike in the neighbouring Northern Peninsular Spanish, obstruents are not allowed in heterosyllabic 'coda' position (C1-C2). Loanwords from Spanish have resulted in C1 deletion.

(6)	**Spanish**	**Getxo**	
	óptiko	ótiko	'optician'
	efékto	eféto	'effect'
	direkθjón	diresíŋo	'direction'
	obsesjón	osesíŋo	'obsession'

Across words, Getxo Basque has a variety of 'repairs' to obstruent-obstruent clusters created at word boundaries, over and above the simple deletion seen in (6) above.

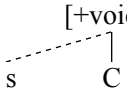
The voiceless sibilant /s/ undergoes voicing before consonantal sonorants and voiced obstruents (7c); in other positions, including before voiceless consonants, word-finally and prevocalically, the /s/ surfaces as devoiced: [s] (7a).

(7)			
	a.	burue[s]	'with a head'
		buru[s] ikisi	'learn by heart (lit. head)'
		burue[s] pentsa	'to think with the head'
		arna[s] andi	'big breath'
		arna[s] tʃara	'bad breath'
	b.	e[z]ne	'milk'
		buru[z] dakit	'I know by heart (lit. head)'

arna[z] luse	‘long breath’
arna[z] gogor	‘strong breath’

Hualde & Bilbao (1992:16) motivate this by a regressive [+voice] spreading rule that targets /s/ in particular.

(8)



Meanwhile, when C1 is a stop [t, k], there are three strategies that are all ‘common’ at the time of Hualde & Bilbao’s (1992) description.

The first does involve the deletion of C1, however, in cases where C2 is a voiced non-continuant obstruent, there is devoicing on C2. This is an opaque, counterbleeding interaction, because the trigger for devoicing is deleted (9a). If C2 is a non-continuant, C1 merely deletes (9b), and in cases where C2 is a non-obstruent it does not devoice (9c).

(9) Strategy 1 - C1 deletion Counterbleeding C2 devoicing

a.	bat bakarik	ba[p]akarik	‘only one’
	suk dusti	su[t]usti	‘you-ERG everything’
	cf. bat plasan	ba[p]lasan	‘one in the square’
b.	bat san	ba[s]an	‘it was one’
c.	bat naiko	ba[n]aiko	‘one (is) enough’

As shown in (10a), in cases where C1 and C2 are both stops, there is also a variant where C1 deletes to a glottal stop, and this also leads to devoicing of C2. This strategy is also available before underlying voiceless stops (10b).

(10) Glottal Strategy

a.	bat bakarik	ba[ʔp]akarik	‘only one’
	suk dusti	su[ʔt]usti	‘you-ERG everything’
b.	bat plasan	ba[ʔp]lasan	‘one in the square’

Interestingly, another frequent variant in optional variation alongside the options in (9) involve preservation of both C1 and C2, but both undergo a lenition process which also leads to their voicing (11a). This also happens before the voiceless continuant obstruent /s/ (11b). This does not occur before underlying voiceless stops, where C1 is retained (11c).

(11) Strategy 2

a. bat bakarik	ba[ðβ]akarik	‘only one’
suk dusti	su[ɣð]usti	‘you-ERG everything’
b. bat san	ba[ðs]an	‘it was one’
c. bat plasan	ba[tp]lasan	‘one in the square’

Hualde & Bilbao (1992) state that Strategy 1 is the default strategy, but they explicitly mention that Strategy 2 is also ‘very common’.

The only case in which a C2 retains voicing in a C1-C2 cluster is the case of the underlying /i/, which in onset position hardens to a palatal stop. In these cases, C1 still deletes.

(12) /bat ian /	ba[$\widehat{ɟj}$]an	‘eat one’
/nik iake/	ni[$\widehat{ɟj}$]ake	‘I-ERG the jacket’

2. **Phonological account of the variants**

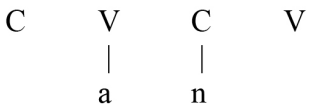
This analysis will be framed in Strict CV (Lowenstamm, 1996; Scheer, 2004). This is an autosegmental framework that assumes two core tiers of representation, a skeletal one made of strictly alternating Cs and Vs, and a melodic tier that houses the segments and their features. These are related to each other by association lines.

The strict contiguity of C and V slots means that vowel-initial and consonant-final words, long vowels, geminate consonants and consonant clusters all skeletally involve some kind of empty slot (see (13) with hypothetical words).

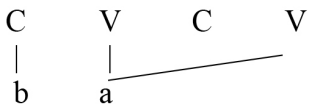
The interpretation of empty positions is constrained by universal principles and some parametric variation. Empty V-slots at the end of domains (FEN – “final empty nuclei”) and within domains are subject to different parameter settings since they can behave differently across languages (Charette, 1991). Crucially, in our analysis, certain languages, with Basque among them, license FEN by system-specific parametric choice, as a result of which they have surface consonant-final words (Kaye 1990).

(13) Common syllabic configurations in Strict CV

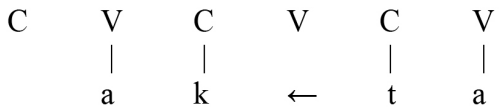
a. Initial vowel/final consonant: /an/



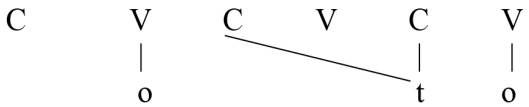
b. Long vowel: /ba:/



c. Consonant cluster: /akta/



d. Geminate consonant: /ot:o/



Perhaps the first thing to note is that Getxo Basque does not have phonetically contrastive duration. It even avoids contextual phonetic length differences when the context would easily provide it.

Unlike English and languages like it, where identical consonants across word-boundaries never result in pseudo-gemination (14a), in Getxo Basque these are resolved as phonetically short (14b) (Hualde & Bilbao, 1992:21).

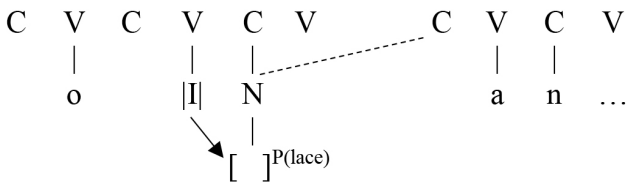
(14) a.	/un + nerving/	u[n:]erving	
	in + Nigeria	i[n:]igeria	
	stop Peter	sto[p:]eter	
b.	senbet + turiste	senbe[t]uriste	‘how many tourists’
	gison + noble	giso[n]oble	‘noble man’
	arnas + sakon	arna[s]akon	‘deep breath’
	asal + luse	asa[l]use	‘long skin’

We conclude therefore that in Getxo Basque even phonologically bipositional structures are interpreted with short phonetic duration.

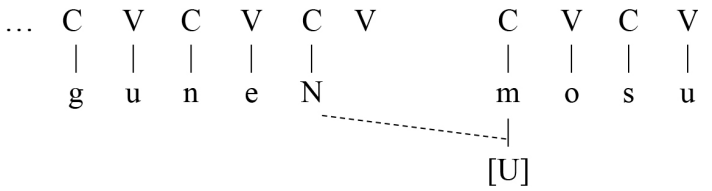
This corresponds with our bipositional/gemination account of cross-morphemic palatalistion in the language (Balogné Bérces & Ulfsbjorninn, to appear), see (15a) beneath. This is further supported by Hualde & Bilbao’s (1992:21) observation that even identical consonants produced by assimilation are also produced as phonetic singletons, see (15b) beneath.

(15) Bipositionality in Getxo Basque

a. /oin + andi/ [ojŋandí] ‘big foot’



b. /lagunen mosu/ lagune[m]osu ‘the kiss of the friend’

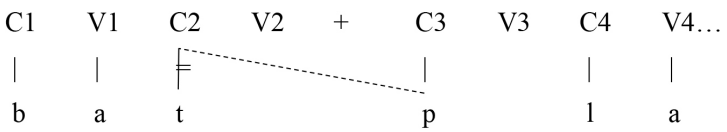


We propose therefore that Strategy 1 (C1-C2 > C2) is chiefly characterised by the creation of a cross-morphemic geminate, which phonetically surfaces as a consonant with a short phonetic duration (we will address the counterbleeding of voicelessness shortly after). As shown in (16) beneath, when C2 and C3 contain consonants and the intervening V2 is empty, the melody of C2 unlinks from C2 and the contents of C3 spread to C2. This forms a geminate, which in Getxo is realised as a singleton consonant.

(16) Strategy 1

a. /bat + plasan/

b. p ∈ {C2, C3} ⇔ [p] ba[p]lasan ‘one in the square’



Strategy 1 applies to all C1-C2 sequences, but there is an extra effect of opaque devoicing to model. To explain this, we need to ponder the

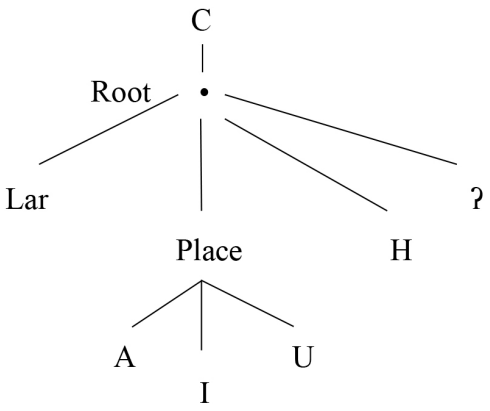
internal structure of the segment according to Element Theory (ET), a non-articulatory featural system (Harris & Lindsey, 1995; Backley, 2011).

(17) Elements and some common acoustic and realisational mappings

Element	Signature	Common implementation (ultimately language specific)
A	Central spectral energy mass, convergence of high F1 and F2	Coronals, Some rhotics, Retroflexes, Uvular and Pharyngeals, Mid and Low vowels.
I	Low F1, high peak of F2 and F3	Some coronals, Post-alveolars, Palatals, Front vowels.
U	Low peak, convergence of F1, F2	Labials, Some velars, Uvulars, Back vowels.
ʔ	Abrupt and sustained drop in overall amplitude	Stops, also nasals and laterals.
L	Periodic murmur	Nasals, voicing in obstruents.
H	Aperiodic noise	Fricatives, Affricates, the noisy burst of stops.

We also follow Harris & Lindsey (1995) in assuming the following segment internal division (itself coinciding strongly with McCarthy's (1988) feature geometry).

(18) Segment structure (Harris & Lindsey, 1995:76)

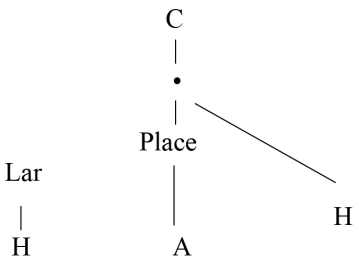


When it comes to Laryngeal specifications, we assume the framework commonly referred to as Laryngeal Realism (Honeybone, 2005; etc.), in which two language types are differentiated: (i) (true) voice systems, which base the laryngeal contrast on a voiced~voiceless distinction (e.g., Slavic and Romance languages); (ii) aspiration systems, which build on aspiration in the form of the distinction between aspirated~unaspirated (or, in traditional terminology, fortis~lenis; e.g., Germanic). Within Element Theory, the standard laryngeally realistic view is that element |L| is responsible for nasality in sonorants, while in obstruents it only marks the lenis/voiced set in voice languages (such as Romance), and fortis/aspirated is marked by element |H| in aspiration systems (such as English). In this privative framework, tenuis obstruents are laryngeally underspecified and receive interpretation in the phonetics only (i.e., unmarked fortis is realised as voiceless in voice systems; unmarked lenis is realised as voiceless but undergoes variable passive voicing in aspiration systems).

Basque is often treated in historical descriptions as an originally aspiration —or fortis~lenis— system, which switched to a now fully established voicing contrast very early on, right after what is called the Pre-Basque period, in all but its northeasternmost dialects, most probably due to contact with neighbouring Romance languages (Martinet, 1950; Michelena, 1977; Trask, 1997; Egurtzegi, 2014; 2019). In contrast, according to an alternative approach (see, e.g., Hualde, 2018), phonologically aspirated stops are an innovation in those northeastern varieties. The present paper takes a stand for the former view, and argues that all present-day varieties of Basque phonologically belong to the aspiration type – it is only in the surface phonetic realisation that the dialects diverge and that the language appears to parallel the Romance obstruent system. The extensive language contact may have influenced the phonetic form, however, the underlying phonological structure of the language remained intact throughout.

Consequently, for the laryngeal status of Getxo Basque, we propose that the only laryngeal feature is |H|, as shown beneath. Stops are either voiceless and marked with |H| or they have no laryngeal feature Ø. True fricatives are marked with |H| and surface as voiceless in all positions. In Getxo Basque /s/ is different, however, because its voicing is contextually determined.

(19) Representation of /s/

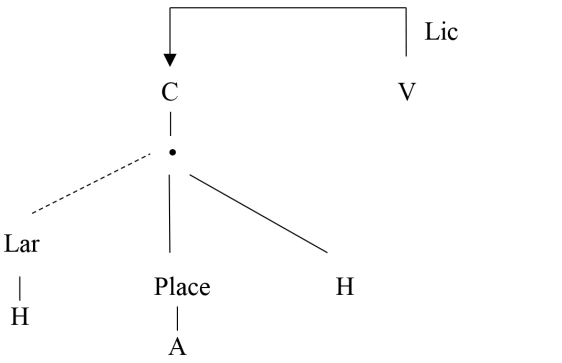


As shown in (19 above, we assume that /s/ has a floating Lar node, which can only be linked in Licensed positions, that is before a filled V-slot or before a FEN (which, like other Romance and Ibero-Romance varieties is parametrically a Licensor (Scheer, 2004:629 for Old French; Ulfsbjorninn, under review)), or obtained by spreading from another position (20c). We therefore propose that in Getxo Basque, s-voicing is actually a coda-lenition process. Elements that are not linked to the structure are stray erased by deletion (shown in grey shading).

(20) s-voicing as lenition

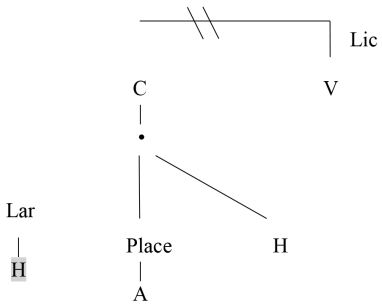
a. Linking LAR in Licensed position

[s]a[s]oi ‘season’
burue[s] ‘with the head’



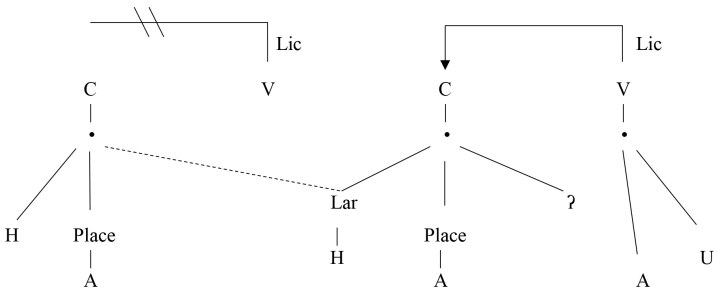
b. Non-linking of LAR in Non-Licensed position

e[z]ne	‘milk’
buru[z] dakit	‘I know by heart’



c. Linking of LAR through spreading

a[s]to	‘donkey’
bo[s]t	‘five’



We now come to C1 deletion counterbleeding the devoicing of C2. Since we have proposed that Basque is not phonologically a ‘true voicing’ language, its stops are contrastive for the presence of H in the Laryngeal node vs. Ø.

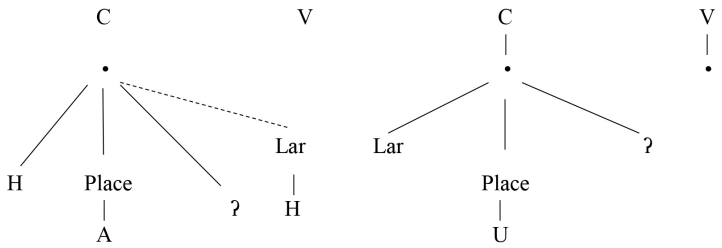
We propose therefore that when a fortis and a lenis stop meet across a word-boundary and undergo gemination, the lenis stop’s empty Lar node fuses with the specified feature of C1. Thereby, the stop in C2 (which does not have its own LAR feature) inherits the |H| feature of the deleted consonant. This gives the appearance of counterbleeding, but it is in fact more of a coalescence, which requires no extrinsic ordering.

Since fortis obstruents are H marked and lenis obstruents are not, it stands to reason that, as long as the two stops C1 and C2 fuse, they will

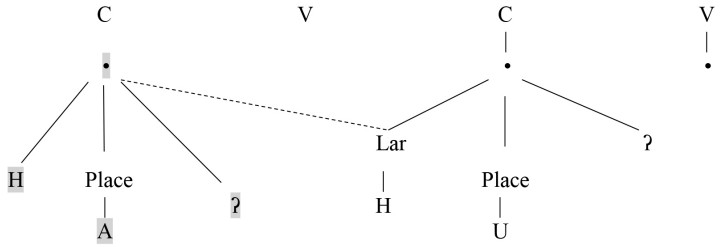
always produce a voiceless outcome. Indeed, all stop-stop sequences word-internally have also resulted in a voiceless outcome ([obsesjón] > [osesíŋo] 'obsession').

(21) /bat + bakarik/ ba[p]akarik 'only one'

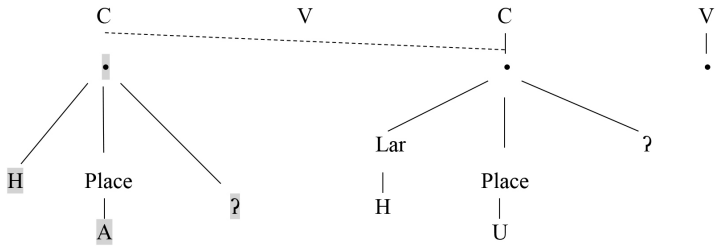
a. Fortis obstruent + lenis obstruent



b. Lar fusion/coalescence

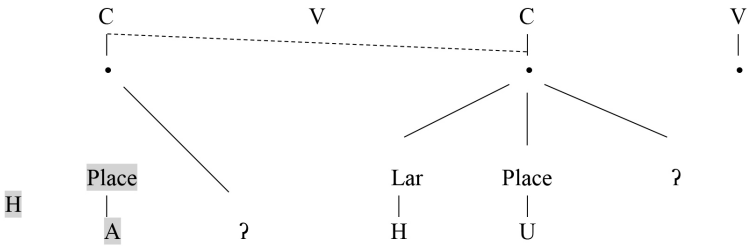


c. Compensatory gemination



If we apply this same series of steps we also obtain the Glottal strategy which applies only in cases where C2 is a non-continuant obstruent. In these cases, the |ʔ| of C1 is permitted to remain attached to C1 at the end of the derivation producing: bat bakarik ba[ʔp]akarik 'only one'. This optional output of this derivation is shown in (22). In this case, we get partial gemination, not complete gemination.

(22) Glottal retention ba[ʔp]akarik ‘only one’



We now come to explain Strategy 2, which you will recall from (11). This pattern was very common and in opposition with the default pattern described thus far. In this case, stop-stop sequences result in the voiced fricative realisation of both C1 and C2: /bat + bakarik/ > ba[ðβ]akarik ‘only one’ & /suk + dusti/ > su[ɣð]usti ‘you-ERG everything’. The core difference between Strategy 1 and Strategy 2 is that the former involves forming this geminate or just partial geminate, whereas strategy 2 does not. It maintains C1 and C2 as independent consonants, however this necessarily involves their lenition.

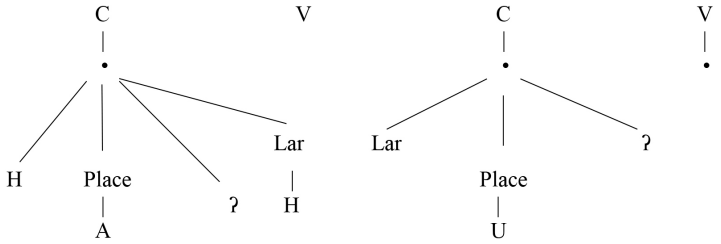
In order to understand this optional process, it is important to understand that Basque (and Spanish) have an interesting relationship to (non-)continuancy, specifically involving issues with feature sharing and heterosyllabicity. What is crucial to note is that Basque and Spanish share a spirantisation rule. Though this rule shows idiolectal and regional variation in both languages, the distributional pattern and phonetic outcome of the rule is effectively identical in the two languages (Hualde, 1991:99-100). This rule is complex (Hualde, 1991:99-107) but, for our purposes, it is important to note that it affects voiced stops in a number of positions, and it also affects voiceless stops in one specific position: where these are in a preconsonantal position (Navarro Tomás, 1977). In pre-consonantal position, voiceless stops also are lenited and lose their non-continuant status. Moreover, voiced stops in Basque (and Spanish) are spirantised/ lenited if they follow a non-continuant: /es + duin/ [ez ð̞uin] ‘neg-worthy’ (Hualde, 1991:100).

We do not have the space to describe or explain the causes of this lenition in any specificity, however, we follow Candia (2016, and references within) in observing that the lenited outcome of stops in spirantisation in Spanish is not that of a true or full-blooded fricative, it is usually a phonetic approximant. Phonologically, therefore, Spanish and Basque lenited stops are best modelled by the knocking out of both its obstruent manner features: |ʔ| and |H|. Since these lenited stops have such a short duration, and they are

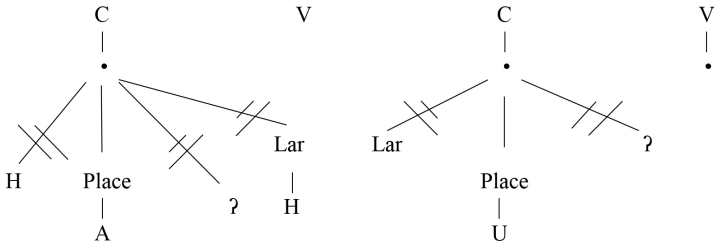
not specified for a laryngeal feature, they are subject to passive voicing (Halle & Stevens, 1971; Cyran, 2014). This leads to their surfacing as short voiced approximants, marked as acoustically quiet fricatives in most transcriptions (and often shown with the 'lowered' diacritic: [β̞ ð̞ ɣ̞]. These are shown beneath.

(23) Strategy 2

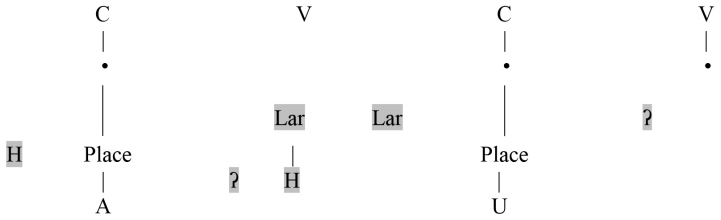
a. Fortis obstruent + lenis obstruent /bat + bakarik/



b. Loss of manner features |H| and |ʔ|



c. ba[ðβ]akarik 'only one'



The specifics of the lenition process and how to obtain the weak fricative approximants could be expanded on, but there is no space to do so here. Suffice it to say that Strategy 2 differs from Strategy 1 in the core sense that it does not preserve bipositionality and as such it is forced to lose

its Lar specifications (and its non-continuancy) and doing so results in the passive voicing of the lenition outcomes. This is summarised in the table in (24) below.

(24) Summary of Getxo Basque CC repairs

/t + b/	Phonological Description	Process	Outcome
Strategy 1	Gemination Laryngeal fusing/coalescence	C1 deletion, Counterbleeding voicelessness	p
Glottal strategy	Partial gemination Laryngeal fusing/coalescence	C1 glottalisation, Voiceless C2	ʔp
Strategy 2	Lenition	Spirantisation, Voicing	ðβ

As a final issue, there is the interesting matter of an apparent exception, where there is a voiced stop that does not become voiceless in Strategy 1. This case is the one where an underlying /i/ is strengthened in initial position and surfaces as a voiced palatal affricate: [$\widehat{\text{ɟʝ}}$] (Hualde & Bilbao, 1992:19).

As with any C1-C2 sequence according to Strategy 1, C1 deletes, however, the voiced palatal affricate does not undergo devoicing. Interestingly, as Hualde & Bilbao (1992) note, this is different to another Western Bizkaian dialect (Zeberio), whose voiced palatal affricate does devoice in this position.

(25)	**Getxo**	**Zeberio**	
/bat ian /	ba[$\widehat{\text{ɟʝ}}$]an	ba[tʃ]an	‘eat one’
/nik iake/	ni[$\widehat{\text{ɟʝ}}$]ake	ni[tʃ]ake	‘I-ERG the jacket’

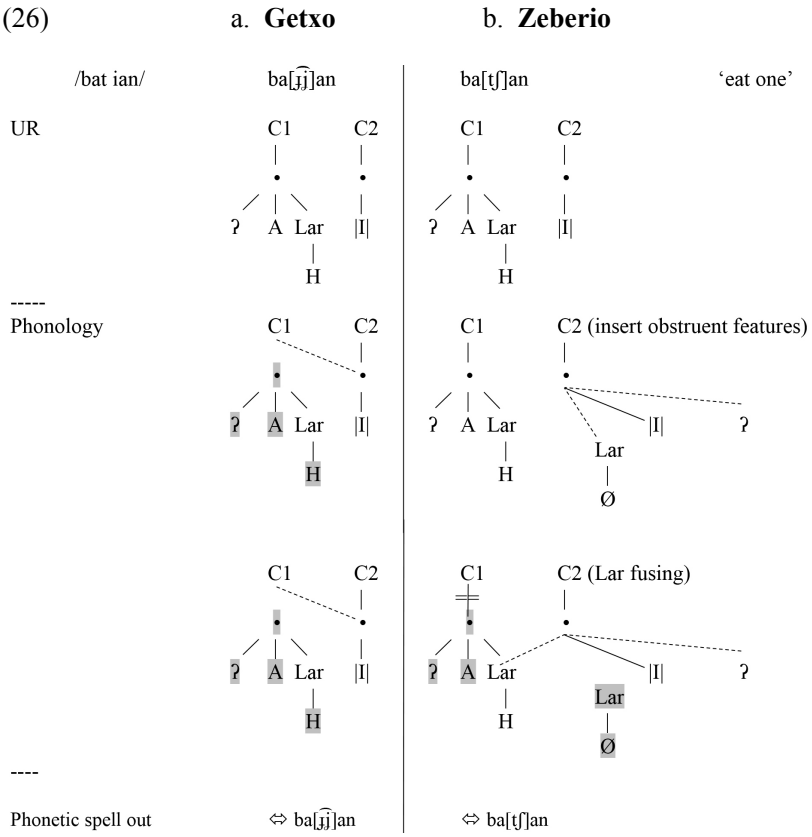
The facts seem to contradict our analysis of Getxo Basque, usually the Lar of lenis C2 is overwritten by |H| in C1, but in this case there is no devoicing of the derived palatal affricate.

The explanation for this in *Substance Free Phonology* (Hale & Reiss, 2008; Volenec & Reiss, 2020), and more specifically Scheer (2019) and Chabot (2021)’s model of spell out, is to say that in Getxo, the /i/ never phonologically has features added to it to make it an obstruent, that phonologically it remains a sonorant despite its phonetic implementation. This correctly models the fact that as far as the phonology is concerned, the cases in (25) are the same as any C1-C2 where C2 is a sonorant.

However, this analysis does not preclude other dialects from *phonologically* adding non-continuancy and laryngeal node to their

strengthened /i/. If these features making /i/ into an obstruent are present phonologically, one would fully expect it to undergo the same processes as any other voiced stop, correctly predicting devoicing in these C1-C2 contexts in Strategy 1. A summary of these two dialects with respect to underlying /i/ is shown in (26).

(26)



In Getxo, the spell out of a bipositional /i/ in C-slots is as a voiced palatal affricate, this is a phonetic manifestation of the phonological end point of the derivation shown in (26a). At no point in the phonology is C2 given the features of an obstruent and as such, the computation proceeds as it would with any other sonorant. Meanwhile in Zeberio, the obstruent features are added in the phonology and consequently, the resultant voiced post-alveolar/palatal affricate is treated as a phonological obstruent, leading

to the fusion of its Lar nodes (and its devoicing) as part of the gemination it undergoes.

3. **Conclusion**

Getxo Basque presented some optionality in its C1C2 repair strategies, one which we labelled Strategy 1 involves C1 deletion which counterbleeds devoicing, similar to this strategy is the Glottal Strategy which is identical to the above but allows C1 to surface as a glottal stop if C2 is also a stop. This exists alongside the otherwise very common Strategy 2, which involves both C1 and C2 surviving to the surface but they are lenited (spirantised/sonorised) and voiced. We have shown that to properly understand the Getxo Basque we must assume the laryngeal realism framework of voicing and state that Getxo Basque is (still) an H-system (as Proto-Basque almost certainly was). From there we show that Strategy 1 is a gemination forming strategy in which the Laryngeal nodes fuse, and the 'voiceless' stops contain H and the 'voiced' contain Ø so the outcome of their fusion is always 'voiceless': H. In contraposition, there is Strategy 2 which crucially differs in that it does not attempt to form a geminate. In this case, the two singleton consonants lenite into weak fricatives (with no Lar specification) this makes them particularly susceptible to passive voicing. Finally, we address an apparent counterexample to the pattern, which in fact fits the pattern perfectly since this voiced stop is only the phonetic interpretation of an underlying /i/, and it patterns as other sonorants do. Interestingly, the alternative does exist in the dialect of Zeberio, where the /i/ is strengthened to a stop in the phonology, and as a consequence undergoes opaque devoicing just like any other stop.

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