Breton non-local spirantization reexamined

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Abstract

In certain dialects of Breton, spirantization triggered by a few possessive adjectives appears to apply their mutation on a non-local word. A plausible diachronic development is proposed in which noun phrases with and without the intervening word were nearly semantically identical, making it easier for the mutation effects on the noun to spread to the construction in which a word intervened between the possessive adjective and the noun. A synchronic solution couched in Distributed Morphology which makes use of string-vacuous Local Dislocation is proposed, which provides a locality-obeying account.

Keywords

Breton – Distributed Morphology – mutations – locality

1 Introduction

Determining the limitations on phonological and morphophonological rules has long been a driving force in linguistic research. With the advent of Optimality Theory (Prince & Smolensky 1993) and the continued popularity of various lexicalist theories of morphology (e.g. Anderson 1992), the desire to curtail the enormously powerful grammatical systems of various proposals has only been heightened. One such proposed curtailment is the restriction of (morpho)phonological rules to apply only to locally adjacent phonemes, or autosegmental units, or morphosyntactic feature bundles, or morphemes. Such a limitation offers a refreshingly stringent curtailment to the overgeneration of non-existent language types.¹ It is imperative, therefore, that the apparent exis-

¹ Embick 2010, 2013 are two recent works which take seriously the restrictions imposed by local-

tence of a non-local rule in Breton be reexamined through the lens of recent developments in linguistic theory. Section 2 presents the necessary facts of Breton: its mutations, the mutation effects of its possessive adjectives, and the seemingly non-local morphophonological rule. Section 3 offers a proposal as to how such a non-local rule could have arisen in the (pre)history of the language. Section 4 critiques two previous synchronic analyses. Section 5 offers a new Distributed Morphology-based approach to the synchronic situation. Section 6 summarizes the results of the paper.

2 Background

2.1 Consonant mutations in Breton

Breton, as is typical of the modern Celtic languages, possesses a rich system of initial consonant alternations or “mutations”. Its system, in fact, is arguably the richest among the Celtic languages with four mutations, all with active morphological triggers: lenition, spirantization, provection, and the so-called ‘mixed’ mutation, which is effectively a restricted lenition with a slight infiltration of provection.² Their effects are:

(1) Breton Mutations

Lenition	Spirantization	Provection	Mixed mutation
<i>p</i> → <i>b</i>	<i>p</i> → <i>f</i>		
<i>t</i> → <i>d</i>	<i>t</i> → <i>z</i>		
<i>k</i> → <i>g</i>	<i>k</i> → <i>c'h</i> ³		
<i>b</i> → <i>v</i>		<i>b</i> → <i>p</i>	<i>b</i> → <i>v</i>
<i>d</i> → <i>z</i>		<i>d</i> → <i>t</i>	<i>d</i> → <i>t</i>
<i>g</i> → <i>c'h</i>		<i>g</i> → <i>k</i>	<i>g</i> → <i>c'h</i>
<i>gw</i> → <i>w</i>			<i>gw</i> → <i>w</i>
<i>m</i> → <i>v</i>			<i>m</i> → <i>v</i>

ity conditions. The former exposes the weakness of certain theories of Optimality Theory with respect to locality conditions, while the latter articulates the shortcomings of lexicalist theories in this regard.

2 There is a very meager reflex of a former nasal mutation, which is still fully productive in Welsh and Irish, in a single item: *dor* ‘door’ nasalizes following the definite article, yielding *an nor* ‘the door’ (Hemon 1975:15, Hemon 1984:24).

3 Orthographic *c'h* = [x], but [h] word-initially after the article or intervocalically (Kemener

The mutations are illustrated below using the following triggers:⁴ the possessive adjectives *da*^L ‘your (sg.)’, *va*^S ‘my’, and *ho*^P ‘your (pl.)’, and the verbal particle *o*^M which forms a present participle with a following verbal noun.⁵

(2) Example of Mutations (from Hemon 1975: 5–6)⁶

Base form	Lenition	Spirantization	Provection
<i>penn</i> ‘head’	<i>da benn</i> ‘your head’	<i>va fenn</i> ‘my head’	
<i>tal</i> ‘forehead’	<i>da dal</i> ‘your forehead’	<i>va zal</i> ‘my forehead’	
<i>kador</i> ‘chair’	<i>da gador</i> ‘your chair’	<i>va c’hador</i> ‘my chair’	
<i>breur</i> ‘brother’	<i>da vreur</i> ‘your brother’		<i>ho preur</i> ‘your brother’
<i>dant</i> ‘tooth’	<i>da zant</i> ‘your tooth’		<i>ho tant</i> ‘your tooth’
<i>glin</i> ‘knee’	<i>da c’hlin</i> ‘your knee’		<i>ho klin</i> ‘your knee’
<i>gwele</i> ‘bed’	<i>da wele</i> ‘your bed’		
<i>mamm</i> ‘mother’	<i>da vamm</i> ‘your mother’		
<i>bevañ</i> ‘to live’	<i>o vevañ</i> ‘living’		

2016:12), though Ternes (2011: 459) states that *c’h* is normally [x] including as the spirantization result of /k/. When representing the lenition result of /g/, however, *c’h* represents [h].

4 For clarification, I use the term ‘trigger’ to indicate a word which causes another word, the ‘target’, to undergo a mutation. As seen in (2), a mutation changes the initial consonant of the base form (or ‘radical form’) of a word. For example, the word *penn* has a radical/base form *penn*, a lenited form *benn*, and a spirantized form *fenn*. In the first line of (2), *penn* is the target and *da* and *va* are the triggers.

5 The superscripts indicate which mutation the triggers induce. L = lenition, S = spirantization, P = provection, M = mixed mutation, K = spirantization of /k/ only.

While I adopt the diacritic approach to mutations for ease of exposition, I do not wish to come down for or against any of the various theoretical approaches to encoding mutations in the speaker’s grammar, feeling that the point is tangential to both the diachronic and synchronic solution proposed here. I thank a reviewer for the reference to Breit 2019, a stimulating proposal for translating the Welsh mutations into a coherent synchronic grammar. Breit does a masterful job at thoroughly laying out the arguments against treating mutations as diacritics as well as against those approaches which effectively supplete the targets. His own approach utilizes phonological features and suppletion of the triggers. The proposal presented in section 5 below is perfectly amenable to Breit’s theory of mutations.

6 For a discussion of the historical development of the mutations in Insular Celtic, see Lewis & Pedersen (1937: 112–47) and Eska (2020a) and the references in the latter. For a discussion of the development of the mutations in Breton see Jackson (1967: 308–71). For spirantization in the Brittonic Celtic languages see Eska (2020b) and the references cited there.

(cont.)

Base form	Mixed mutation
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<i>dont</i> 'to come'	<i>o tont</i> 'coming'
<i>gortoz</i> 'to wait'	<i>o c'hortoz</i> 'waiting'
<i>gwelout</i> 'to see'	<i>o welout</i> 'seeing'
<i>mont</i> 'to go'	<i>o vont</i> 'going'

2.2 Possessive adjectives

Every mutation aside from the mixed mutation is triggered by at least one of the possessive adjectives. Their forms are:

(3) Possessive Adjectives (cf. Press & ar Bihan 2004:54)

<i>va</i> ^S 'my' ⁷	<i>hor/hon/hol</i> ^K 'our'
<i>da</i> ^L 'your (sg.)'	<i>ho(c'h)</i> ^P 'your (pl.)'
<i>e</i> ^L 'his, its'	<i>o</i> ^S 'their'
<i>he(c'h)</i> ^S 'her, its'	

A few comments are in order. The 3rd sg. feminine *he(c'h)*^S and 2nd pl. *ho(c'h)*^P drop the *-c'h* when the following word begins in a consonant.⁸

(4) *he*^S v. *hec'h*^S

<i>he mamm</i> 'her mother'	v.	<i>hec'h eontr</i> 'her uncle'
<i>ho mamm</i> 'your mother'		<i>hoc'h eontr</i> 'your uncle'

The first person plural *hor/hon/hol*^K triggers a reduced spirantization which affects only *-k-* (Hemon 1975:8).⁹

⁷ There is an alternate form *ma*^S.

⁸ A reviewer makes the intriguing suggestion that /x/ could simply be the reflex of spirantization before vowel-initial words, comparable to h-prothesis in Irish *ainmneacha* 'names' but *na hainmneacha* 'the names' (Stenson 2008: 37). One problem with this proposal, though, is that vowel-initial words following the other two possessive adjectives which cause spirantization do not appear with initial *c'h*: *va eontr* 'my uncle' and not **va c'heontr*.

⁹ The choice of *hon* v. *hor* v. *hol* depends on the initial segment of the following noun and mir-

(5) Reduced spirantization

Base form	Reduced spirantization
<i>karr</i> 'car'	<i>hor c'harr</i> 'our car'
<i>kirri</i> 'cars'	<i>hor c'hirri</i> 'our cars'

2.3 Non-local mutation

Stump (1988) called attention to the fact that in Breton as described by Kervella (1947: 97) and Trépos (2009: 62), the three possessive adjectives which trigger spirantization, *va*^s, *he(c'h)*^s, *o*^s, can target a noun which is separated from the possessive adjective by the adjective *holl*^L 'all, whole'.¹⁰

rors the pattern of the definite article (*an* ~ *ar* ~ *al*) and indefinite article (*un* ~ *ur* ~ *ul*). Specifically, *hol* occurs before a word beginning with *l*-; *hon* before a vowel, a coronal (*n*-, *t*-, *d*-) or *h*-; *hor* occurs in other environments.

10 Stump (1988: 461⁶) extensively details which Breton grammars make no mention of this phenomenon and the reader is referred to the footnote indicated. He concludes that "nothing definite can be inferred from the fact that these grammars and dictionaries do not mention the possibility that *holl* may intervene between a mutation trigger and its target; certain grammarians may have simply overlooked this peculiarity of the Breton mutation system, or may have decided not to discuss it. It is clear, however, that at least some dialects lack this phenomenon altogether." Later in his article (475–77), Stump cites other Breton grammars which have variations of this phenomenon; see footnotes 12 and 15 below.

Kervella (1947:97), whose grammar indicates in notes those peculiarities tied to specific regions, does not list any specific region for this phenomenon, leading one to assume that he viewed it as standard. To cite him in full, "pa vez an anv-gwan *gwir*, ha dreist-holl *holl* o tont war-lerc'h an anvioù-gwan perc'hennañ *va*, *he*, *o*, e vez graet peurvuiañ en anv war-lerc'h ar c'hemmadur dre c'hwezañ kentoc'h eget ar c'hemmadur dre vlotaat" ("when the adjective *gwir*, and especially *holl* come after the possessive adjectives *va*, *he*, *o*, the noun is most often made according to spirantization rather than lenition"; tr. mine).

Trépos (2009:62) also makes no mention of localization to a specific dialect, simply writing "La présence de OLL: tout, entre ces possessifs et le nom n'empêche pas l'initiale du nom de *muter*" ("The presence of OLL: 'all', between these possessives and the noun does not impede the initial of the noun from mutating;" tr. mine).

More recently, Press (2010: 439), in an extensive chapter on Breton, simply writes without dialectal qualification that "the quantifier (*an*) *holl* + noun ... may be overruled if *holl* is preceded by a word requiring another mutation."

An anonymous reviewer is absolutely correct in insisting that the dialects where this phenomenon occurs be expressly indicated. Unfortunately, the three sources indicated above do not pinpoint any specific region but appear to be grammars of Standard Breton, though Stump (1988:461) does mention that Kervella and Trépos themselves were native speakers from northwestern and southwestern Cornouaille respectively. It is cer-

(6) Non-Local spirantization (data from Stump 1988: 461–62)

Underlying form	Output	Lenited non-output
<i>va^s holl^L plijadur</i>	→ <i>va holl flijadur</i> ‘all my pleasure’	NOT * <i>blijadur</i>
<i>va^s holl^L tud</i>	→ <i>va holl zud</i> ‘all my people’	NOT * <i>dud</i>
<i>he^s holl^L peadra</i>	→ <i>he holl feadra</i> ‘her whole fortune’	NOT * <i>beadra</i>
<i>he^s holl^L karantez</i>	→ <i>he holl c’harantez</i> ‘all her love’	NOT * <i>garantez</i>
<i>o^s holl^L per</i>	→ <i>o holl fer</i> ‘all their pears’	NOT * <i>ber</i>
<i>o^s holl^L trubuilhoù</i>	→ <i>o holl zrubuilhoù</i> ‘all their troubles’	NOT * <i>drubuilhoù</i>

When not preceded by these three possessive adjectives, *holl^L* triggers lenition as in the following three examples.

(7) Lenition after *holl^L*

Underlying form	Output
<i>holl^L deizioù va^s buhez</i>	→ <i>holl zeizioù va buhez</i> ‘all the days of my life’
<i>an holl^L ti</i>	→ <i>an holl di</i> ‘the whole house’
<i>hon^K holl^L ged</i>	→ <i>hon holl c’hed</i> ‘all our hope’

Only a restricted class of words can intervene between possessive adjectives and their possessee. Aside from *holl^L*, this class consists of (1) a small group of adjectives,¹¹ (2) cardinal and ordinal numbers, and (3) comparative and superlative adjectives. Some of these adjectives cause lenition, and a handful of the numerals cause either lenition or spirantization. Curiously, however, the non-local mutation triggered by the possessive adjectives which spirantize as

tainly imperative that the precise dialectal limitation of this non-local spirantization be determined, but I will leave that task to field linguists better situated than me. It is my belief that, since this process has interesting implications for diachrony and various synchronic theories, it can be fruitfully explored in those venues despite the outstanding question of its exact dialectal localizations.

11 The adjectives are *berr* ‘short’, *brizh* ‘spotted, motley’ (pejorative), *dister* ‘puny’, *gwall* ‘bad’, *gwir* ‘true’, *hir* ‘long’, *kaezh* ‘poor’, *kozh* ‘old’ (pejorative), and *krak* ‘short’.

represented in (6) is only possible with intervening *holl^L*.¹² This is illustrated in (8), in which the spirantization of the possessive adjective *va^s* does not affect the noun across the words *gwir^L* and *daou^L* respectively. Some examples from Standard Breton:

(8) No Non-Local Spirantization

Underlying form		Output
<i>va^s gwir^L pried</i>	→	<i>va gwir bried</i> ‘my true spouse’
	NOT	* <i>va gwir fried</i> (from <i>Kantik ar Baradoz</i>)
<i>va^s daou^L mab</i>	→	<i>va daou vab</i> ‘my two sons’ (from the Breton Bible)

Before proceeding to an overview and critique of Stump’s synchronic analysis, a brief excursus as to how this state of affairs arose diachronically is in order.

3 Diachronic developments

While the synchronic situation seems chaotic to say the least, the analogical pressures which resulted in it are anything but messy. First, it should be pointed out that semantically *holl^L* does not limit or restrict the contents of a set but is exactly equivalent to the entirety of the set itself. For instance, the members of the set ‘my books’ are precisely identical to the members of the set ‘all my books’. Likewise with an abstract noun, whatever contents of the set phrase ‘my hope’ identifies, the set is isometric to the composition of the set represented by ‘my whole hope’. Fundamentally, therefore, *holl^L* and its English equivalents

12 Of the references in footnote 10, only Kervella mentions anything beyond *holl^L* as being able to intercede, though he does uniquely qualify that this non-local mutation especially (*dreist-holl*) occurs with *holl^L*. See Stump (1988: 475–7) for a summary of slight dialectal variations on this non-local mutation mentioned in the following: Hingant (1868), Le Gléau (1973), Le Roux (1896), Malmanche (1907), and Moal (1890). See also footnote 15 below.

'all ~ whole', regardless of whatever intensive tinge they may add to the meaning of a phrase, do not alter the composition of a set.¹³ This is absolutely not the case with the other adjectives and numerals which can intervene between the possessive adjective and the noun in Breton. For instance, the set represented by 'my friends' is not necessarily equivalent to the set 'my true' (*gwir^L*) 'friends' nor the set 'my best' (*gwellañ*) 'friends', nor the set 'my five' (*pemp*) 'friends'.

Therefore, it is reasonable to imagine that the meanings of phrases like *va flijadur* 'my pleasure' and *va holl blijadur* 'all my pleasure' were so close semantically that the one could influence the other. Specifically, the mutation associated with the former spread into the latter, suppressing the lenition of the semantically superfluous *holl*, yielding *va holl flijadur* 'all my pleasure'.

(9) Analogical Spread of Spirantization
(the equals sign means *is semantically equivalent to*)

base: *plijadur*

va flijadur 'my pleasure' = *va holl blijadur* 'all my pleasure'
→ *va (holl) flijadur* '(all) my pleasure'

base: *tud*

va zud 'my people' = *va holl dud* 'all my people'
→ *va (holl) zud* '(all) my people'

base: *carr*

va c'harr 'my car' = *va holl garr* 'my whole car'
→ *va (holl) c'harr* 'my (whole) car'

The crucial question then is, why do the other possessive adjectives—the ones which do not trigger spirantization—not also skip *holl^L* and mutate the noun? The answer is straightforward for *da^L* 'your (sg.)' and *e^L* 'his' since they cause the same mutation as *holl^L* and therefore there never would have been a difference in the noun following *da^L* and *e^L* on the one hand, and *da^L holl^L* and *e^L holl^L* on the other.

(10) **base:** *plijadur*

da blijadur 'your (sg.) pleasure' *da holl blijadur* 'all your pleasure'
e blijadur 'his pleasure' *e holl blijadur* 'all his pleasure'

¹³ Note that *holl* in the meaning 'completely' follows the modified adjective (Press 1986: 348).

base: *tud*

da dud 'your (sg.) people'

e dud 'his people'

da holl dud 'all your people'

e holl dud 'all his people'

base: *carr*

da garr 'your (sg.) car'

e garr 'his car'

da holl garr 'your whole car'

e holl garr 'his whole car'

The failure of the remaining two possessives, *hon/hor/hol^K* 'our' and *ho(c'h)^P* 'your (pl.)', to likewise target a noun across intervening *holl^L* is equally straightforward. The former, only causing spirantization before a *k*- and therefore not being reinforced by spirantization of *p*- and *t*-, was not able to dislodge the lenition caused by *hon holl^L*.

(11) **base:** *carr*

hor c'harr 'our car'

hon holl garr 'our whole car'

but without spirantization:

base: *plijadur*

hor plijadur 'our pleasure'

hon holl blijadur 'our whole pleasure'

base: *tud*

hon tud 'our people'

hon holl dud 'all our people'

At first glance the pattern caused by *ho(c'h)^P* 'your (pl.)' seems identical to that caused by the three possessive adjectives which cause spirantization, *va^S* 'my', *he(c'h)^S* 'her', *o^S* 'their'. Specifically, the output of the provection caused by *ho(c'h)^P* is different from the lenition caused by *holl^L*.

(12) *breudeur* 'brothers'

ho preudeur 'your (pl.) brothers'

holl vreudeur 'all brothers'

dent 'teeth'

ho tent 'your (pl.) teeth'

holl zent 'all teeth'

genoù 'mouth'

ho kenoù 'your (pl.) mouth'

holl c'henoù 'whole mouth'

Compare the different results of spirantization (after *va^S*) and lenition (after *holl^L*).

(13) <i>plijadur</i> ‘pleasure’	<i>va flijadur</i> ‘my pleasure’
	<i>holl blijadur</i> ‘all pleasure’
<i>tud</i> ‘people’	<i>va zud</i> ‘my people’
	<i>holl dud</i> ‘all people’
<i>carr</i> ‘car’	<i>va c’harr</i> ‘my car’
	<i>holl garr</i> ‘whole car’

Why then, does *ho holl* not behave like *va holl* and suppress the lenition triggered by *holl^L*, as seen by contrasting (14) with (15)?

- (14) Lenition by *holl^L* blocks provection by *ho(c’h)^P*
<i>breudeur</i> ‘brothers’	<i>ho holl vreudeur</i> ‘all your brothers’
<i>dent</i> ‘teeth’	<i>ho holl zent</i> ‘all your teeth’
<i>genoù</i> ‘mouth’	<i>ho holl c’henoù</i> ‘your whole mouth’
- (15) Lenition of *holl^L* trumped by spirantization of *va^S*
<i>plijadur</i> ‘pleasure’	<i>va holl flijadur</i> ‘all my pleasure’
<i>tud</i> ‘people’	<i>va holl zud</i> ‘all my people’
<i>carr</i> ‘car’	<i>va holl c’harr</i> ‘my whole car’

A solution lies in a striking fact which differentiates the outputs of provection and spirantization. Namely, the results of provection (*p*, *t*, *k*) are potential lenition targets, while the results of spirantization (*f*, *z*, *c’h*) are not. In fact, the latter are not the targets of any of the Breton mutations. Were speakers to have generalized the provection in a case like *ho preudeur* ‘your brothers’ to apply to *ho holl* + NOUN yielding **ho holl preudeur*, the jarring lenition target (*p*-) seemingly unaffected by the immediately preceding lenition trigger (*holl^L*) would have resulted in a highly unique situation. Nowhere else in Breton would a mutable consonant be preceded by a mutation trigger which seems to be inactive and does not affect the following consonant.¹⁴ Such a situation seems to have been avoided by speakers and therefore non-local provection never arose, only non-local spirantization.¹⁵

14 Note that in a situation like *an holl blijadur* ‘all the pleasure’ < *plijadur* the output *blijadur* is still a lenition target. However, unlike the hypothetical situation in **ho holl preudeur* mentioned in the text in which *holl^L* never causes lenition to begin with, in *an holl blijadur* the radical *plijadur* has been targeted by *holl^L* and has undergone lenition. In sum, once a trigger causes a change in the radical of a target, it may not subsequently cause the mutation again even if the mutated radical is still a phonological input for the mutation.

15 Stump (1988: 476–77) discusses five offshoots of this non-local rule in specific dialects

4 Synchronic analysis

Stump (1988) was the first to attempt to account for Breton non-local spirantization synchronically. He assumes the Trigger Constraint:

(16) Trigger Constraint

The trigger determining a rule feature for a morphophonemic rule must be adjacent to the affected word and c-command it

ZWICKY (1984: 389)

After presenting and rejecting four approaches to the problem, Stump settles upon a pair of proposals which he terms the *intervention analysis* and the *transfer analysis*. The former weakens the Trigger Constraint by allowing only a named element to intervene between a target and its trigger. In the Breton case at hand, *holl^L* is the named element. The transfer analysis, on the other hand, keeps the Trigger Constraint unmodified but allows for a trigger to spread its mutation to an adjacent element, rendering that element the new trigger of the mutation. Therefore *va^s holl^L plijadur* would supposedly become *va holl^s plijadur* before yielding *va holl flijadur*. Stump proposes limitations to such a transfer, such as that the element which becomes the new trigger must be a named element (again, that would be *holl^L* here) and the trigger itself cannot be further transferred to yet another word.

Stump does not come down in support of one of these analyses over the other, but he does acknowledge one objection to them both, namely, “that in their present forms, they are both overly stipulative” (p. 480). It seems, however, that the *transfer analysis* is far more stipulative since it is not clear what in the grammatical system would prevent the mutation triggering ability from spreading beyond the adjacent word. Clearly it would be desirable, as Stump himself discusses, to have this follow naturally from the system and not be stated by force. More problematic, however, is its failure to account for how lenition could apply in a phrase like *va holl zeizioù* ‘all my days’ < *va^s holl^L*

some affecting only /p-/ and another allowing *gwir^L* ‘true’ and *eil^L* ‘second’ to intervene between the possessive adjective and the noun. All of these are amenable to the synchronic analysis proposed in section 5. Diachronically, I view them generally as simplifications of the system under discussion here on the way towards its ultimate loss in the respective dialects. In the dialect described by Le Gléau (1973: 54) in which *gwir^L* and *eil^L* are able to intervene, I assume that they were pulled into this very limited set by formal analogy to *holl^L*.

deizioù. If spirantization was transferred from *va* to *holl*, dislodging the latter's own underlying lenition (i.e. *va*^S *holl*^L *deizioù* > *va* *holl*^S *deizioù*), then the expected outcome would be **va* *holl* *deizioù* since the lenition of *holl* would have been replaced by the transfer of spirantization from *va*. Since initial voiced stops are not subject to spirantization, however, there would be no effect on *deizioù*, resulting in **va* *holl* *deizioù*.

Iosad (2014), in his discussion of the Breton dialect of Bothoa in the Parallel Structures Model of feature geometry (Morén 2006), devotes a brief excursus to the non-local spirantization in focus here. His solution is to sever the mutation trigger from the possessive adjectives themselves. The mutation trigger causing spirantization is an autosegmental agreement prefix which appears with possessed nouns. Such a delinking of the trigger of spirantization from the possessive adjective allows for the trigger to not necessarily be adjacent to the target. This shares some similarity to Stump's *transfer analysis* but it avoids the problem of having the mutation transfer across multiple words and potentially landing on a target other than a noun. Iosad's proposal avoids this in that spirantization can only ever affect the possessed noun, since the mutation is specifically linked to an agreement autosegment which marks agreement on possessed nouns.

Iosad makes strong arguments for his analysis and it accounts for the data well. One weakness of his approach, though, is that it appears that only the possessive adjectives which trigger spirantization have an autosegmental agreement prefix. The other possessive adjectives, both those which trigger lenition and provection, do not have such an autosegmental prefix. Iosad is led to this conclusion since he attempts to differentiate between *restricted spirantization*, which affects only [k, tʃ],¹⁶ and *full spirantization*, which affects all the voiceless stops. He concludes that the two types of spirantization "must be the exponents of two distinct lexical items" (2014: 11), and thus he sets up autosegmental morphemes whose phonological constituencies differ across the two types of spirantization.¹⁷ Since there is no *restricted lenition* in contrast to *full lenition*, he is not forced to set up autosegmental agreement morphemes as lenition triggers dissociated from the lexical items themselves. As a result, one consequence that follows from Iosad's analysis "is that non-local behavior should be unique to spirantization: in particular, provection should be strictly local, since it involves only the interaction of adjacent segments rather than agreement" (13). The benefit of this prediction, which falls out naturally from his theory,

16 This is indicated by ^K in this paper; see footnote 5.

17 The reader is referred to Iosad's work for the details of his admirable and thorough proposal on the synchronic machinery behind mutations in Breton.

is outweighed, however, by the undesirable complexity and loss of parallelism in the morphosyntactic structure of the possessive adjectives: three possessive adjectives are accompanied by agreement morphemes, whereas the others are not.

The *intervention analysis*, therefore, seems more promising since it requires less machinery and fewer questionable assumptions. There is, nevertheless, still a problem. What beyond a stipulation prevents two or three named elements from being able to intervene between a mutation trigger and its target? Also, why are the possessive adjectives involved in this non-local mutation and not other mutation triggers? What is needed is the rendering of the *intervention analysis* into a morphological system whose architecture offers inherent limitations. Distributed Morphology (DM) (Halle & Marantz 1993, Embick 2015) is precisely such a system.

5 Non-local spirantization in DM

The central tenet of DM is that morphology operates on the structures which are the output of the syntax. There is no separate Lexicon with its own principles and structures which are wholly detached from syntactic structure, as in lexicalist theories of morphology (cf. e.g. Anderson 1992). Therefore, to understand the non-local spirantization in *va holl plijadur* we must examine the structure the syntax outputs:¹⁸

18 The terminal nodes in the output of the syntax contain only syntacticosemantic features and not yet the actual phonological realizations of those features. The Breton words are simply inserted here for clarity.

Following syntax, Vocabulary Insertion (VI) linearizes the syntactic structure as the phonological realizations of the syntactic terminal nodes are inserted. Crucially, the syntactic structure is not eradicated during this process, but its constituents are maintained. Thus a linearization of (17) is the following:

(18) [va^S [holl^L [plijadur]]]

Embick & Noyer (2001) differentiate between two different post-syntactic movement operations, Lowering and Local Dislocation. The former occurs before VI and hence before linearization, whereas the latter occurs after VI. Since the hierarchical structure is still in place during lowering, a head can be lowered to another head, skipping intervening non-heads. This is precisely the situation in the expression of tense in English. The head of T(ense) dominates the head of V(erb) as can be seen in any English sentence with a modal:

(19) T V
Mary will loudly play the trumpet.

When T is not occupied by a modal or an auxiliary, however, the spell-out of T lowers to attach to the head of V in the form of an affix.

(20) V-T
Mary loudly play-s the trumpet.

 V-T
Mary loudly play-ed the trumpet.

The adverb 'loudly' is adjoined to V, therefore it can be skipped in lowering. The following simplified tree illustrates the lowering and adjunction of -s from T to V:

Since it applies after VI, the domain of Local Dislocation (LD) is limited to the output of linearization. Embick & Noyer (2001) make precise the limits and types of LD, drawing on a variety of languages including Latin. The exact details of their analysis of Latin are beyond the scope of this article, but their aim is to account for the location of the enclitic conjunction *-que* ‘and’, which attaches to the first word of the second conjunct.

- (22) *Input:* (Conjunct 1 *XY*) *-que* (Conjunct 2 *WZ*)
Output: (Conjunct 1 *XY*) *t_i* (Conjunct 2 *W-que_i Z*)

When the second conjunct is a P(repositional) P(hrase) *-que* as expected attaches to P.

- (23) *circum-que ea loca*
around-and those places
‘and around those places’

contrā-que lēgem
 against-and law
 ‘and against the law’

Curiously, however, when the preposition is monosyllabic, *-que* can attach to the noun and not the P.

(24) *in rēbus-que*
 in things-and
 ‘and in things’

dē prōvinciā-que
 from province-and
 ‘and from the province’

Embick & Noyer (2001: 576) account for this by positing a string-vacuous variety of LD which unites a monosyllabic P with its object into a single *subword* as in (25). Below, the symbol + indicates a subword connection and * indicates a morphosyntactic word connection.

(25) *-que* * [*in* * *rē* + *bus*] → *-que* * [*in* + *rē* + *bus*]

Local Dislocation of the clitic *-que* then results in the desired output:

(26) *-que* * [*in* + *rē* + *bus*] → [*in* + *rē* + *bus* + *que*]

As can be seen, a *subword* is effectively the equivalent of a single terminal node of syntax, whereas a *morphosyntactic word* is effectively a word. *Rēbus*, therefore, is a morphosyntactic word which consists of two subwords, *rē-* and *-bus*. After the string-vacuous LD of *in rēbus*, the entire PP becomes a morphosyntactic word which consists of three subwords: *in*, *rē-*, and *-bus*. As Embick & Noyer point out, support for this proposal is found in Latin orthography “which occasionally treated monosyllabic prepositions as part of the same word as the complement” (2001: 576²⁷).

I propose that a comparable string-vacuous LD applies in Breton non-local spirantization. When a possessive adjective which causes spirantization is immediately followed by *holl^L*, the possessive adjective and *holl^L* combine into a single subword; the adjective is effectively acting as a proclitic. Since they are now in morphological terms a single word, their mutation effects will target the immediately following morphosyntactic word. Furthermore, since the

subparts of the word are vocalized from left to right, the spirantization associated with the possessive adjectives will occur before the lenition of *holl^L*, since *va^S* precedes *holl^L* in the morphosyntactic word.^{19,20}

(27) String Vacuous Local Dislocation
*va^S * [holl^L * [plijadur]]* → *va^S + holl^L * [plijadur]*

(28) Mutations of a Subword applying Left → Right

Post LD	<i>va^S + holl^L * plijadur</i>	<i>va^S + holl^L * deiz + ioù</i>
1st Mutation	<i>va holl^L flijadur</i>	N/A
2nd Mutation	N/A	<i>va holl zeizioù</i>
Output	<i>va holl flijadur</i>	<i>va holl zeizioù</i>

Claiming that the possessive adjectives *va^S*, *he^S*, and *o^S* act as proclitics in this environment is not completely unfounded. Crosslinguistically, possessive adjectives often are clitics, and in Breton the 1st and 2nd sg. possessive adjectives do in fact act as enclitics by attaching to the prepositions *da^L* ‘to’ and *e* ‘in’.

19 Breit (2019: 100–01), in a discussion of a non-local mutation in Irish (i.e. *ár dhá dteach* ‘our two houses’ with nasalization on ‘teach’ ‘house’ caused by *ár* ‘our’), hints at one possible account which is similar in spirit to what is proposed here: “If *dhá* could be shown in some way to undergo a merger, perhaps resembling a second position effect, with the pronoun, the terminal realizing the mutation may end up to the right of the numeral.” Following Breit, another reasonable possibility could be to supplete the triggers in Breton. Namely, *holl* could come in at least two shades. One, *holl^S*, could trigger spirantization when preceded by *va*, *he(c’h)*, and *o* and the other, *holl^L*, the elsewhere form, would cause lenition everywhere else. In this connection, an anonymous reviewer suggests that the syntactic sequence *va^S holl^L* is lexicalized as *va holl^S* and selected during vocabulary insertion by words beginning with voiceless plosives. The advantages of either of these two proposals, which come at the price of postulating suppletive forms which are identical segmentally save for the mutations which they trigger, could become clear in a thorough theory of mutations in Breton.

20 For a related proposal in which the mutation which occurs first linearly in a word acts before one which follows, see Adger (2006: 646–48). In Adger’s analysis of Old Irish word order, he requires that the mutation triggered by a pronominal object affect the following verb instead of the mutation triggered by a FORCE feature, despite the latter being closer to the verb in the complex: pronoun-FORCE-verb.

- (29) $da^L + ma^S \rightarrow da'm^K$ 'to my'
 $da^L + da^L \rightarrow da'z^P$ 'to your'
- $e + ma^S \rightarrow em^K$ 'in my'
 $e + da^L \rightarrow ez^P$ 'in your'

This proposal avoids the problem of Stump's *transfer analysis*, since *holl^L* never gives up its lenition in order to take on the spirantization of *va^S*. Its lenition is simply bled by spirantization occurring first, since the latter yields voiceless fricatives which are not targets for lenition. This proposal also avoids the problems of Stump's *intervention analysis*. On the one hand, it is unsurprising that possessive adjectives are involved in the non-local spirantization as opposed to other mutation triggers, since possessive adjectives, as just stated above, are commonly clitics crosslinguistically. On the other hand, in order for a second word to intervene, such as another adjective (e.g. *gwir* 'true') for instance, the subword *va holl* would need to form a subword with *gwir*. Outside of compound words, there is no evidence in Breton that an adjective acts as a clitic. Therefore the required subword *va + holl + gwir* would never arise; rather, the structure would remain a subword plus a morphosyntactic word *va + holl * gwir*.

This proposal is similar to Iosad's in that the three possessive adjectives which trigger spirantization require certain added morphological machinery. This proposal, however, has the advantage that it utilizes a morphological operation, Local Dislocation, which has not only been proposed for data sets from other languages, but whose applicability to the possessive adjectives, whose clitic status is evident elsewhere in Breton, seems more than reasonable. Iosad's use of autosegmental elements, on the other hand, adds a layer of morphological complexity which does not have the benefit of being motivated by any phonological aspects of the possessive adjectives themselves the way the present proposal can appeal to their clitic-like nature.

That string-vacuous local dislocation is limited only to a subset of the possessive adjectives might seem odd. Nevertheless, the synchronic grammar of any language is never a perfect system with no oddities scattered throughout. Rather, a synchronic grammar is the dustbin of the various phonological and sporadic analogical changes which have altered a language over countless generations. As Sapir stated (1921:39): "Unfortunately, or luckily, no language is tyrannically consistent. All grammars leak." The striking behavior of the three spirantization-inducing possessive adjectives in the synchronic grammar is not as aberrant once a plausible analogical history has been proposed, as is the case here (see section 3 above).

6 Conclusions

This paper has offered a locality-satisfying proposal for a seemingly non-local morphophonological rule in Breton. A plausible diachronic picture was drawn to explain how such a rule could have arisen. Using the tools of DM as applied to other languages including Latin—specifically the proposal of string-vacuous local dislocation—a synchronic analysis was offered which made the non-local rule local.

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