Rhotic Metathesis in Algherese Catalan: A Harmonic Serialism Account

Francesc Torres-Tamarit[1], Clàudia Pons-Moll[1,2], and Maria Cabrera-Callís[2]
[1]Universitat Autònoma de Barcelona and [2]Universitat de Barcelona

1. Introduction

In the light of the diachronic process of rhotic metathesis that has applied in Algherese Catalan,[1] in this paper we provide some empirical evidence for considering the left edge of the stem a prominent position, along the lines of Alber 2001.

A Harmonic Serialism analysis of the data is presented, as well as a comparison with parallel OT. It is argued that the typological predictions that derive from Harmonic Serialism are more restrictive than those derived from parallel OT. Only resorting to Harmonic Serialism, indeed, long-distance metathesis can be discarded as a potential process of natural languages (Hume 2001). It is also proven how only resorting to Harmonic Serialism the two rhotic metathesis patterns found in Algherese Catalan can be accounted for in unison.

2. Data

In Algherese Catalan, liquids show a puzzling distribution that has traditionally been referred to as liquid interchange (Bosch and Armangué 1995). Table (1) presents the three phonological processes that involve liquids: rhotacism, lateralization and metathesis. Notice that only native words undergo those processes, whereas borrowed forms are not affected by them.

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[1] Algherese is a variety of Catalan spoken in the city of Alghero, in the island of Sardinia (Italy).

(1)

Process	*Involved segment / Context*	*Examples*	
		Native words	*Loanwords*
I. Rhotacism	a. *l* in intervocalic position	*oli* [ˈɔ.ɾi] ‘oil’ *bolet* [bu.ˈɾɛt] ‘mushroom’	*coca-cola* [ˌko.ka.ˈkɔ.la] ‘coke’ *colino* [ko.ˈli.no] ‘strainer’
	b. *l* as C_2 of a complex onset	*clau* [ˈkɾaw] ‘key’ *ungla* [ˈuŋ.gɾa] ‘nail’	*blues* [ˈblus] ‘blues’ *clicar* [kliˈka] ‘to click’
	c. *d* in intervocalic position	*nadal* [na.ˈɾal] ‘Christmas’	*judo* [ˈd͡ʒu.do] ‘judo’
II. Lateralization	d. *r* in pre-consonantal coda position	*mort* [ˈmɔlt] ‘dead-*masc*’ *morta* [ˈmɔl.ta] ‘dead-*fem*’	*pírcing* [ˈpir.siŋgᵉ] ‘piercing’ *gorgonzola* [gor.gon.ˈᵈzo.la] ‘gorgonzola’
III. Metathesis	e. *r* in pre-consonantal coda position	*forment* [fɾu.ˈment] ‘wheat’	*fòrceps* [ˈfɔr.t͡sips] ‘forceps’
	f. *r* as C_2 of a complex onset	*cabra* [ˈkɾa.ba] ‘goat’	*cobra* [ˈko.bra] ‘cobra’

As shown in table (1), the lateral is banned as onset but preferred as coda, and the rhotics are banned as codas but preferred as onsets.

In this paper, we only focus on the diachronic process of rhotic metathesis. Rhotic metathesis in Algherese Catalan follows two different patterns (see Bradley 2007 for Judeo-Spanish and modern Spanish, who also exhibit cases of leftward rhotic metathesis: *taberna* > taˈβɾena ‘bar’, *catedral* > katɾeˈðal ‘cathedral’; Russell Webb and Bradley 2009 for other cases of Romance metathesis; and Alber 2001 and Frigeni 2005 for Campidanian Sardinian, which also shows analogue cases of intrasyllabic rhotic metathesis: latin DORMIRE > ˈdromːi ‘sleep’, latin FORMICA > froˈmːiɣa). In the intrasyllabic metathesis pattern, a rhotic in the coda followed by a consonant migrates to the onset of the same syllable. In the intersyllabic metathesis pattern, a rhotic in a complex onset migrates to the onset of the preceding syllable. Some examples are given in (2) (taken from Scala 2003 and Cabrera-Callís 2009).

(2)

(a) *Intrasyllabic metathesis*:

Old Algherese	*Modern Algherese*		
es.to<u>r</u>.nell	es.t<u>r</u>o.nell	[as.tɾu.ˈnel]	‘starling’
fo<u>r</u>.mat.ge	f<u>r</u>o.mat.ge	[fɾu.ˈmad.d͡ʒu]	‘cheese’
fo<u>r</u>.ment	f<u>r</u>o.ment	[fɾu.ˈment]	‘wheat’
fo<u>r</u>.mí.go.la	f<u>r</u>o.mí.go.la	[fɾu.ˈmi.gu.ɾa]	‘ant’
pe<u>r</u>.fum	p<u>r</u>e.fum	[pɾa.ˈfum]	‘perfume’

tu̲r.nell	tu̲ɾu.nell	[tɾu.ˈnel]	‘ankle’
tu̲r.ment	tu̲ɾu.ment	[tɾu.ˈment]	‘torture’
do̲r.mir	du̲ɾo.mir	[ru.ˈmi][2]	‘to sleep’
en.do̲r.mis.car	en.du̲ɾo.mis.car	[an.ru.mis.ˈka]	‘to doze off’

(b) *Intersyllabic metathesis*:

Old Algherese	*Modern Algherese*		
ca.bɾa	cɾa.ba	[ˈkɾa.ba]	‘goat’
fe.bɾer	fɾe.ber	[fɾa.ˈbe]	‘February’
fe.bɾós	fɾe.bós	[fɾa.ˈbos]	‘fevered’
pa.tɾó	pɾa.tó	[pɾa.ˈto]	‘patron’
pe.bɾe	pɾe.be	[ˈpɾɛ.ba]	‘pepper’
po.bɾe	pɾo.be	[ˈpɾɔ.ba]	‘poor’
tem.plɑ	tɾem.pa	[ˈtɾem.pa]	‘temper’
ten.dɾe	tɾen.de	[ˈtɾɛn.da]	‘tender’
co.gom.bɾe	co.gɾom.be	[ku.ˈgɾom.ba]	‘cucumber’
es.fon.dɾar	es.fɾon.dar	[as.frun.ˈda]	‘to tumble down’
ca.te.dɾal	ca.tɾe.dal	[ka.tɾa.ˈdal]	‘cathedral’
u.fà.bɾi.ca	u.fɾà.bi.ca	[u.ˈfɾa.bi.ka]	‘basil’
des.tɾal	dɾes.tal	[ras.ˈtal]	‘axe’
doc.tɾi.na	dɾoc.ti.na	[ru.ˈti.na]	‘catechism’

3. Descriptive generalizations

The first pattern (2a) is related to the general avoidance in this dialect of pre-consonantal rhotic codas (in word-internal position), which also explains the process of lateralization of this consonant in the same context (see (1)). The second pattern (2b) can be interpreted as a prominence effect in that a marked structure, a complex onset, is preferred in a prominent position, the left edge of the stem, and not in a non-prominent position. (Note that the relevant prominent position is the left edge of the stem and not the left edge of the morphological word (*cf. com-promitir*, **crom-pomitir* ‘to com-promise’.)

The migration of the rhotic cannot exceed more than one syllable (*co.gom.bre* > *co.grom.be cf.* *cro.gom.be ‘cucumber’, *ca.te.dral* > *ca.tre.dal vs.* *cra.te.dal ‘cathedral’). Exceptionally, the rhotic can skip one syllable if this syllable has no onset. This means that the rhotic can exceed more than one syllable in order to preserve its syllabic position (*po.a.gra* > *pro.a.ga*, **po.ra.ga* ‘podagra’).

Metathesis is only allowed to syllables already containing an onset (*a.gre* > *a.gre*, **ra.gue* ‘sour’).

4. Theoretical background

4.1. Harmonic Serialism

Harmonic Serialism (McCarthy 2010 and references cited there) is a non-stratal derivational version of standard parallel Optimality Theory (Prince and Smolensky 1993/2004). Harmonic Serialism has two requirements: gradualness and harmonic improvement.

Gradualness imposes a one-change-at-a-time condition on generated candidates. Candidates differ only minimally from the most recent input. Derivations are not parallel, but gradual, serial. An

[2] Orthographic <d> lacks a correspondent in the phonetic forms of *dormir*, *endromiscar* and *destral*. This is due to deletion triggered by the avoidance of **dr* sequences in onset position. This issue is discussed more extensively in 5.4.

interesting question that arises in Harmonic Serialism is what making one change at-a-time means. This is an empirical issue. The most extended idea is that making one change at-a-time is equivalent to incurring one violation of a faithfulness constraint. If this is true, then the theory of CON shapes the theory of GEN. Given that surface forms in natural languages are not in general limited to a single unfaithful mapping, gradualness necessarily needs a GEN → EVAL → GEN… loop, in the sense that the output of EVAL is fed back to GEN, and so on. This loop finishes when the winning candidate is the fully faithful parse of the latest input. At that point, the derivation converges and the final output is selected.

At each step of the derivation, the winning candidate has to be either more harmonic than the most recent input (in this case the derivation continues) or identical to the most recent input (in this case there is convergence).

4.2. GEN and the metathesis operation in Harmonic Serialism

GEN can be understood as a list of operations in Harmonic Serialism. Given gradualness, generated candidates are the result of applying only one of those operations. With respect to metathesis, our hypothesis is that GEN can randomly select one segment from the input string, and then change its linear relation with respect to another segment.

This assumption seems to predict the existence of long-distance metathesis. However, we propose that CON contains two LINEARITY constraints that stand in a stringency relation. The less stringent one, $\text{LINEARITY}_{\text{non-local}}$, only disfavors those candidates in which two non-adjacent segments in the input surface with a different linearization in the output. The more stringent one, LINEARITY, disfavors any metathesis pattern, those involving adjacent segments or non-adjacent segments.

The ranking between two constraints in a stringency relation is always unknown, given that they never conflict. However, they can be ranked by transitivity. This situation will be observed in our analysis.

The proposal of this paper relies on the fact that local metathesis is always the most harmonic path to both intra and intersyllabic metathesis in Algherese Catalan, except when local metathesis is blocked by a higher-ranked markedness constraint. In the latter case, only long-distance metathesis is optimal.

4.3. Constraints

This subsection presents and defines the proposed constraints. Their activity will be discussed further in the analysis.

(3)

(a) *Markedness constraints*

*COMPLEX-ONSET/Right-Stem (*COMP-ONS/R-St): Assign one violation mark for every complex onset that stands at the right syllable of the stem.

*COMPLEX-ONSET/Middle-Stem (*COMP-ONS/M-St): Assign one violation mark for every complex onset that stands at the middle syllable of the stem.

*COMPLEX-ONSET/Left-Stem (*COMP-ONS/L-St): Assign one violation mark for every complex onset that stands at the left syllable of the stem.[3]

$\text{NO-CODA}_{[\text{rhotic}]}$C: Assign one violation mark for every pre-consonantal rhotic parsed as a syllable

[3] The left and the right edge of the stem are morphological positions that have traditionally been adduced to explain asymmetric phonological behaviors within the stem: markedness and faithfulness constraints indeed are usually relativized according to those positions. Although being controversial, we refer to the medial position for expository convenience. An independent motivation for defining the *COMPLEX-ONSET constraint on such specific constituents is observable in language acquisition, in the sense that word-initial complex onsets are first acquired than word-internal complex onsets (Lleó 1997).

coda. (Adapted from Prince and Smolensky 1993.)

When applying these markedness constraints, the number of syllables of the word is not relevant, since the set of examples in (2a) entail intrasyllabic metathesis: *r* migrates from the coda to the onset of the same syllable —no matter how many syllables the word has. The only word containing more than three syllables in (2b) is *u.fà.bri.ca*, which behaves as a three-syllable word in what metathesis concerns: the migration of the rhotic cannot exceed more than one syllable (*u.fà.br̲i.ca* → *u.fr̲à.bi.ca*), as well as it happens in three syllable words (cf. *ca.te.dr̲al* → *ca.tr̲e.dal*). Notice that, moreover, the rhotic cannot migrate to the first syllable of the word *u.fà.bri.ca* since, as indicated in the text (see §3), metathesis is only allowed to syllables already containing an onset.

(b) *Faithfulness constraints*

LINEARITY$_{\text{non-local}}$ (LIN$_{\text{non-loc}}$): Let *input* = $i_1i_2i_3...\ i_n$ and *output* = $o_1o_2o_3...\ o_m$. Assign one violation mark for every pair i_w and i_y if and only if $i_w\ \mathcal{R}\ o_x$ and $i_y\ \mathcal{R}\ o_z$, i_w precedes i_y, o_z precedes o_x, and o_z and o_x are not adjacent. (Based on McCarthy and Prince 1995, McCarthy 2008.) [Avoid long-distance metathesis.]

LINEARITY (LIN): Let *input* = $i_1i_2i_3...\ i_n$ and *output* = $o_1o_2o_3...\ o_m$. Assign one violation mark for every pair i_w and i_y if and only if $i_w\ \mathcal{R}\ o_x$ and $i_y\ \mathcal{R}\ o_z$, i_w precedes i_y, and o_z precedes o_x. (McCarthy and Prince 1995, McCarthy 2008) [Avoid metathesis.]

5. Analysis

5.1. Intrasyllabic metathesis

As previously said, the intrasyllabic metathesis pattern is characterized by the migration of a rhotic in the coda to the onset of the same syllable (see 2a). The general avoidance of rhotics in pre-consonantal coda position is attributed to the activity of the markedness constraint NO-CODA$_{[\text{rhotic}]}$C, which dominates LINEARITY, the anti-metathesis faithfulness constraint.[4] The first step of the derivation of an input containing a rhotic in coda position appears in tableau (4).

(4)

Step 1

formatge	NO-CODA$_{[\text{rhotic}]}$C	LIN	*COMP-ONS/ L-St
a. → fro.mat.ge		*	*
b. for.mat.ge	*!		

Violating LINEARITY in (4) also implies a violation of the prominence driven markedness constraint *COMPLEX-ONSET/Left-Stem, which disfavors complex onsets at the left edge of the stem, considered a prominent position within the stem. This markedness constraint is also dominated by NO-CODA$_{[\text{rhotic}]}$C. The output of this step is fed back to GEN and serves as the input to the next step of the derivation, in which the winning candidate is the fully faithful one, as tableau (5) illustrates.

(5)

Step 2 → Convergence

fro.mat.ge	NO-CODA$_{[\text{rhotic}]}$C	LIN	*COMP-ONS/ L-St
a. → fro.mat.ge			*
b. for.mat.ge	*!	*	

[4] We assume that other strategies to satisfy the markedness constraints inducing metathesis, such as deletion or insertion, are ruled out by the relevant faithfulness constraints.

5.2. Intersyllabic metathesis in two-syllable words

The intersyllabic metathesis pattern refers to those cases in which a rhotic that occupies the second element in a complex onset migrates to the onset of the preceding syllable (see 2b). As opposed to the intrasyllabic metathesis pattern, the driving force of intersyllabic metathesis is the prominence driven markedness constraint *COMPLEX-ONSET/Right-Stem, which militates against complex onsets that stand at the right edge of the stem. As tableau (6) shows, *COMPLEX-ONSET/Right-Stem dominates NO-CODA$_{[rhotic]}$C.

(6)

Step 1

Cabra	*COMP-ONS/ R-St	LIN$_{non\text{-}loc}$	NO-CODA$_{[rhotic]}$C	LIN	*COMP-ONS/ L-St
a. → car.ba			*	*	
b. cra.ba		*!		*	*
c. ca.bra	*!				

At the first step of the derivation, the winning candidate is candidate (a), in which local metathesis has applied. Candidate (a) is more harmonic than candidate (c) because *COMPLEX-ONSET/Right-Stem dominates NO-CODA$_{[rhotic]}$C, given that applying local metathesis gives rise to a rhotic in coda position. It also dominates LINEARITY. Candidate (b) is the candidate in which long-distance metathesis has applied. This is a possible operation in Harmonic Serialism given the assumptions exposed above in subsection 4.2. But this candidate fatally violates the higher-ranked constraint LINEARITY$_{non\text{-}local}$, which prohibits long-distance metathesis. This constraint only dominates NO-CODA$_{[rhotic]}$C. The second step of the derivation appears in (7).

(7)

Step 2

car.ba	*COMP-ONS/ R-St	LIN$_{non\text{-}loc}$	NO-CODA$_{[rhotic]}$C	LIN	*COMP-ONS/ L-St
a. → cra.ba				*	*
b. car.ba			*!		
c. ca.bra	*!			*	

Candidate (a) is selected at the second step of the derivation. Applying local metathesis again is the most harmonic solution under the proposed ranking of constraints. The fully faithful candidate, candidate (b), fatally violates NO-CODA$_{[rhotic]}$C. Candidate (c), in which the rhotic migrates to the right edge of the stem, is the same as the fully faithful parse of the original input at the first step of the derivation. Candidate (c) is ruled out because it violates *COMPLEX-ONSET/Right-Stem, which dominates *COMPLEX-ONSET/Left-Stem. The derivation converges at the next step of the derivation.

(8)

Step 3 → Convergence

cra.ba	*COMP-ONS/ R-St	LIN$_{non\text{-}loc}$	NO-CODA$_{[rhotic]}$C	LIN	*COMP-ONS/ L-St
a. → cra.ba					*
b. car.ba			*!	*	
c. ca.bra	*!	*		*	

It must be said that the second step of the derivation of *cabra* in (7) is equivalent to the first rhotic metathesis pattern of *formatge* in (4).

At this point of the analysis, one important question arises: how to control the direction of the metathesis process (and discard, for instance, candidates such as *cabar*)? There exist three possible solutions: (a) protecting the word or stem-final position by a faithfulness constraint (*à la* Krämer 2003); (b) relativizing the LINEARITY constraint (with an explicit reference to the rhotic); or (c) modifying the markedness constraint(s) responsible for the process of metathesis (with reference to the rhotic and not the complex onset, *à la* Alber 2001). For ease of exposition, candidates with rightward metathesis will be ignored and this issue will be addressed in further research.

5.3. Intersyllabic metathesis in three-syllable words

In three-syllable words, when the rhotic that occupies the second element of a complex onset appears at the right edge of the stem, the migration of the rhotic cannot exceed more than one syllable. Tableaux (9) and (10) illustrate the first two steps of the derivation.

(9)

Step 1

catedral	*COMP-ONS/ R-St	$LIN_{non\text{-}loc}$	NO-$CODA_{[rhotic]}$C	LIN	*COMP-ONS/ M-St	*COMP-ONS/ L-St
a. → ca.ter.dal			*	*		
b. ca.tre.dal		*!		*	*	
c. cra.te.dal		*!		*		*
d. ca.te.dral	*!					

(10)

Step 2

ca.ter.dal	*COMP-ONS/ R-St	$LIN_{non\text{-}loc}$	NO-$CODA_{[rhotic]}$C	LIN	*COMP-ONS/ M-St	*COMP-ONS/ L-St
a. → ca.tre.dal				*	*	
b. ca.ter.dal			*!			
c. cra.te.dal		*!		*		*

Tableau (10) demonstrates that NO-$CODA_{[rhotic]}$C also dominates *COMPLEX-ONSET/Middle-Stem. At the third step of the derivation there is convergence, and metathesis to the left edge of the stem is thus blocked.

(11)

Step 3 → Convergence

ca.tre.dal	*COMP-ONS/ R-St	$LIN_{non\text{-}loc}$	NO-$CODA_{[rhotic]}$C	LIN	*COMP-ONS/ M-St	*COMP-ONS/ L-St
a. → ca.tre.dal					*	
b. car.te.dal			*!	*		
c. cra.te.dal		*!		*		*

At the third step of the derivation, candidate (c) is ruled out because it violates $LINEARITY_{non\text{-}local}$. The most important fact at this point is that the migration of the rhotic to the first syllable of the stem is blocked because of the ranking NO-$CODA_{[rhotic]}$C » *COMPLEX-ONSET/Middle-Stem. Given that metathesis always applies in a local fashion, the candidate *car.te.dal*, which represents the necessary step before reaching *cra.te.dal*, is less harmonic than candidate (a), in which the rhotic appears at the middle of the stem, because it violates NO-$CODA_{[rhotic]}$C.

5.4. Cases of intersyllabic long-distance metathesis

In some cases, the application of local metathesis gives rise to highly marked consonant clusters. In these cases, local metathesis is blocked by the phonotactic cover constraint *CC.C, which penalizes pre-consonantal tautosyllabic coda clusters. Actually, Algherese Catalan avoids consonant clusters by deletion of the first consonant: *parlar* [pa.ˈla] 'to speak', *setmana* [sa.ˈma.na] 'week', *objecte* [u.ˈd͡ʒe.ta] 'object', *instrument* [is.tru.ˈment] 'instrument'). In these cases, long-distance metathesis is the most harmonic solution.

(12)

Step 1

doctrina	*COMP-ONS/ R-St	*CC.C	LIN$_{non\text{-}loc}$	NO-CODA$_{[rhotic]}$C	LIN	*COMP-ONS/ L-St
a. → droc.ti.na			*		*	*
b. docr.ti.na		*!		*	*	
c. doc.tri.na[5]	*!					

In order to obtain the right results, *CC.C must dominate LINEARITY$_{non\text{-}local}$. The derivation terminates at the next step because there is no way to improve harmony. It is worth noting that in native words syllable-initial *dr* clusters are prohibited, and this is enforced by deleting the stop: *doctrina* [ru.ˈti.na] 'teaching of catechism', *lladre* [ˈra.ʎa][6] 'thief', *pedra* [ˈpe.ra] 'stone'. (Notice that in the first two cases, this simplification pattern interacts with metathesis, where metathesis should precede simplification in derivational theories. However, there is a limited set of words, like *pedra* [ˈpe.ra], in which no metathesis applies. See, among others, Bosch and Armangué 1995, Bosch 2002, Scala 2003 and Cabrera-Callís 2009 for more details.)

5.5. The interaction between rhotacism and intersyllabic metathesis

There is empirical evidence that rhotacism of *l* parsed as the second element of a complex onset should precede metathesis in a derivational model. From a rule-based perspective, in *templa* 'temple', rhotacism must precede metathesis in order to get the actual output *trempa*. Otherwise, with the reversed ordering between those two processes, metathesis would not be able to apply, because only *r* is subject to metathesis, and only rhotacism would surface, **tempra*.

Based on a vast array of evidence from different Romance languages, Pons (2008, in press) proposes that laterals are more sonorous than trills, and less sonorous than taps. This way, rhotacism of *l* as the second element of a complex onset can be interpreted as a process triggered by the Sonority Dispersion Principle (Clements 1990), which states that sonority is maximally dispersed in the initial demisyllable. This explains why an obstruent + tap cluster is preferred rather than an obstruent + lateral cluster, given that in the former the sonority distance between the two segments is greater. The ranking responsible for this process is illustrated in (13), adapted from Pons (2008). These constraints are a simplified version of constraints regulating the sonority in onsets (see Baertsch 2002, Baertsch and Davis 2005, Davis and Baertsch 2008 and Pons (in press) for a more refined proposal).

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[5] As an anonymous reviewer points out, this candidate could actually not violate *COMPLEX-ONSET/Right-Stem, but *COMPLEX-ONSET/Middle-Stem. However, the syllabification pattern in (12c) is a simplification of the facts. The rightmost syllable of the stem is in fact (*trin*). We assume that syllable-building operations are serial and cyclic in the sense that the last segment of a root cannot be syllabified at once with the first segment of an affix. A more detailed derivation should be *doc.trin.a* > *droc.tin.a* > *droc.ti.na*, in which first metathesis applies and then resyllabification of the last segment of the root as the onset of the inflectional vowel takes place.

[6] The case of *lladre* [ˈra.ʎa] displays a special metathesis pattern, in which the rhotic and the lateral switch positions ([ˈʎ$_1$a.dr$_2$a] → [ˈdr$_2$a.ʎ$_1$a] → [ˈra.ʎa]). First metathesis applies and the locus of the rhotic is occupied by the lateral, and vice versa. Finally, the *dr* cluster is simplified, and this is enforced by deletion of *d*.

(13)

*ONSET$_{obstruent+lateral}$ » IDENT(manner), *ONSET$_{obstruent+tap}$

(14)

Step 1: rhotacism

templa	*ONSET $_{obstr+lat}$	IDENT (man)	*ONSET $_{obstr+trill}$	*COMP-ONS/ R-St	*CC.C	LIN$_{non-loc}$	NO-CODA$_{[rhotic]}$C
a. → tem.pra		*	*	*			
b. tem.pla	*!						

(15)

Step 2: long-distance metathesis due to the activity of *CC.C

tem.pra	*ONSET $_{obstr+lat}$	IDENT (man)	*ONSET $_{obstr+trill}$	*COMP-ONS/ R-St	*CC.C	LIN$_{non-loc}$	NO-CODA$_{[rhotic]}$C
a. → trem.pa						*	
b. temr.pa					*!		*

5.6. Standard parallel OT analysis

Standard parallel OT is capable of selecting the actual output in three-syllable words with a different ranking of the constraints. Our suspicion with the parallel OT analysis relies on the assumptions about which position in the stem is the most prominent. The tableau in (16) demonstrates that both right and left edges must be considered less prominent positions than the middle position. But this result is not intuitive, since both the right and left edges of the word play an important role in phonology, and they are usually considered to be prominent. In HS, at least, the relative ranking between *COMPLEX-ONSET/Left-Stem and *COMPLEX-ONSET/Middle-Stem is unknown. This fact seems to be more desirable than assuming a hierarchy in which *COMPLEX-ONSET/Left-Stem dominates *COMPLEX-ONSET/Middle-Stem, as standard parallel OT seems to require.

(16)

catedral	NO-CODA$_{[rhotic]}$C	*COMP-ONS/ R-St	*COMP-ONS/ L-St	LIN	*COMP-ONS/ M-St
a. → ca.tre.dal				*	*
b. cra.te.dal			*!	*	
c. ca.te.dral		*!			
d. car.te.dal	*!			*	

What remains to be proven in our Harmonic Serialism analysis, however, is the ordering between *COMPLEX-ONSET/Right-Stem and *COMPLEX-ONSET/Middle-Stem in that the final position (*i.e.* the right edge) could be considered more prominent than the middle one, and therefore the constraint targeting it should be ranked below the one targeting the middle position. In fact, in our analysis these constraints are ranked in the order *COMPLEX-ONSET/Right-Stem » *COMPLEX-ONSET/Middle-Stem, because of transitivity: *COMPLEX-ONSET/Right-Stem » NO-CODA$_{[rhotic]}$C and NO-CODA$_{[rhotic]}$C » *COMPLEX-ONSET/Middle-Stem.[7]

[7] An anonymous reviewer points out the possibility of considering Bradley's (2007) definition of LINEARITY as a gradient constraint, violated once for every segment that *r* passes over in an input-output mapping. If this approach is taken into account in our analysis, a ranking in which *COMPLEX-ONSET/Right-Stem dominates both *COMPLEX-ONSET/Middle-Stem and *COMPLEX-ONSET/Left-Stem is obtained, instead of the counterintuitive ranking in which *COMPLEX-ONSET/Left-Stem dominates *COMPLEX-ONSET/Middle-Stem in (16). Overall, we leave this issue for future research.

6. Final remarks

This paper provides a Harmonic Serialism analysis of the diachronic process of rhotic metathesis that has applied in Algherese Catalan.

It has provided some empirical evidence for considering the left edge of the stem a prominent position. This observation has been formalized resorting to a set of prominence driven constraints that disfavor a complex onset in different positions within the stem. The high ranking of *COMPLEX-ONSET/Right-Stem, indeed, triggers intersyllabic rhotic metathesis in two and three-syllable words with a complex onset at the right syllable of the stem (*cabra* > *car.ba* > *cra.ba* 'goat'; *catedral* > *ca.ter.dal* > *ca.tre.dal* 'cathedral'). It has also been shown how the general avoidance of a rhotic in pre-consonantal coda position, also found in other Romance varieties, triggers intrasyllabic metathesis (*formatge* 'cheese' > *fro.mat.ge*).

It has been argued that the typological predictions that derive from Harmonic Serialism are more restrictive than those derived from parallel OT: only resorting to Harmonic Serialism, long-distance metathesis can be discarded as a highly frequent process of natural languages, which directly follows from the existence of two LINEARITY constraints that stand in a stringency relation. The cases of long-distance metathesis will always be harmonically bounded by the cases of local metathesis. If it is assumed that (apparent) long-distance metathesis is the result of local metathesis two advantages follow. First, both metathesis patterns, intra and intersyllabic, are unified: the second step of the intersyllabic metathesis derivation corresponds to the intrasyllabic metathesis pattern itself. Second, the migration of the rhotic cannot exceed more than one syllable (*catedral* > *ca.tre.dal cf. *cra.te.dal* 'cathedral'); this is justified because local metathesis is always preferred if possible; the derivation *catedral* > *ca.ter.dal* > *ca.tre.dal* gets stuck at this point because applying local metathesis after *ca.tre.dal* implies a non-harmonically-improving violation of NO-CODA$_{[rhotic]}$C, and this is predicted by the gradualness requirement on GEN, which confers to it a myopic nature.

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