Coda Nasals in Catalan: a Harmonic Serialism Analysis

1. HARMONIC SERIALISM. Since Classic Optimality Theory (OT) came to light different versions have been developed in order to expand its descriptive and explanatory adequacies. One of these versions is Harmonic Serialism (HS) (McCarthy 2000, 2008, 2010). As opposed to Classic OT, HS is a derivational theory of grammar in the sense that (a) EVAL applies successively until no *harmonic improvement* can be achieved given a language-particular hierarchy of constraints; and (b) GEN has a *gradualness* requirement —GEN-generated candidates can only differ from their input by means of one violation of a faithfulness constraint. **2. THE CODA/ONSET ASYMMETRY.** In McCarthy 2008 the coda/onset asymmetry —the fact that generally codas but never onsets undergo processes of deletion or assimilation— finds a satisfactory explanation in HS. The theory of CON interacts with gradualness because GEN operations must be linked only to one unfaithful mapping. I follow the features-as-entities approach described in McCarthy 2008 and interpret Cluster simplification as a double process of *debuccalisation* —or loss of Place feature specification— and Place autosegment spreading. The core ideas of this approach are not new in the phonological literature (see Mascaró 1986, 1987 who interprets it as a double process of autosegmental deassociation and featural spreading). The crucial point in McCarthy 2008 is that by assuming MAX[Place] HS can account for the coda/onset asymmetry because only when a Place autosegment is deleted in coda position there is better performance on the higher-ranked markedness constraint CODA-CONDITION, which assigns violation marks for every token of [Place] that is not associated to segments in the syllable onset. **3. GOALS.** HS together with a conception of features as entities seem to give a satisfactory explanation of two cases of phonological opacity involving Coda nasals —a case of underapplication of a splitting process of Coda palatal nasals in Majorcan Catalan and a case of overapplication of Place assimilation of Coda nasals in Central Catalan. The same hierarchy required to explain these two types of opacity in HS can also be extended to explain intralinguistic variation as regarding different degrees of Place assimilation of Coda nasals in three Catalan varieties. The new ideas that this paper develops focus on (a) the need for introducing new universal constraints that refer to autosegmental representations (MAX[Link] and HAVE-SEGMENT); and (b) the need for rethinking the onset-licensing definition of the constraint CODA-CONDITION in McCarthy 2008 by splitting it into a universal fixed hierarchy of markedness constraints derived by harmonic alignment that refer to different structural configurations of Coda nasals. This kind of universal fixed hierarchy of markedness constraints (see [1]) establishes a link between elements of a linguistic natural scale —in this case *DORSAL, *LABIAL >> *CORONAL— and a linguistic licensing-structure position (*MEDIAL-CODA >> *FINAL-CODA >> *ONSET). Notice that only in the first two top-ranked constraints in (1) COR is considered the most marked Place. This is so because of its weak acoustic clues in a context favoring Place assimilation such as Medial-Coda. However, in Final-Coda the more marked Place is DOR|LAB. **4. DESCRIPTION OF THE DATA.** Catalan exhibits different degrees of Place assimilation depending on the variety. In Modern Algherese dorsal, labial and coronal nasals trigger Place assimilation in Medial-Coda contexts and dorsal and labial nasals are neutralized in Final-Coda position. Majorcan and a prior stage of Algherese (Mascaró 1987) follow the pattern of Modern Algherese but do not neutralize final dorsal and labial nasals. Finally in Central Catalan only coronal nasals in Medial-Coda position trigger Place assimilation. Moreover, in Majorcan Catalan there is a splitting process that applies to medial Coda palatal nasals that gives rise to a diphthong and a nasal that is homorganic with the following consonant: (a) *a*[ɲ] 'year' cf. *a*[jm.p]*assat* 'last year' (Mascaró 1986, 1987, Pons 2005). But a case of underapplication arises when the Coda nasal is coronal underlyingly: (b) /n##ɲ/ surfaces as [ɲ.ɲ] (*só*[ɲ.ɲ]*ores* 'they are chillies') whereas (c) /ɲ##ɲ/ surfaces as [j.ɲ] (*codo*[j.ɲ]*afegós* ‘dirty jelly’). Finally there is another case of opacity in which the structural context that makes Place assimilation applicable is invisible at the surface representation in Central Catalan. This is so because Place assimilation and Cluster simplification are in counterbleeding order: *ve*/n+k/ → *ve*[ŋ] ‘I sell’ cf. **ve*[n] (Mascaró 1976, McCarthy 2006). **5. HS ANALYSIS.** The different degrees of Catalan Place assimilation can be accounted for using the universal fixed hierarchy of CODA-CONDITION in (1). The position that MAX[Place] occupies is the responsible for the variation found in this language. In Majorcan MAX[Place] is higher-ranked because in this variety Place autosegments are not deleted. The crucial constraint in Majorcan is MAX[Link], in which only the association line that links the melody with the skeleton is deleted. The reason for this is that Place autosegments must remain untouched in order to derive the splitting process of Coda palatal nasals. The different behavior of Coda palatal nasals in Catalan is explained by the different ranking of the same constraints: (a) the Place autosegment is kept in Central Catalan —*a*[ɲ.p] *assat* ‘last year’ because MAX[Place] >> *MC/DOR|LAB; (b) loss of the Place autosegment and subsequent spreading of the Place associated to the segment in the syllable onset in Algherese —*a*[m.p] *assat* because *MC/DOR|LAB >> MAX[Place] and *N >> DEP[Link]; and (c) splitting of the palatal nasal in Majorcan —*a*[jm.p] *assat* because *MC/DOR|LAB, MAX[Place] >> MAX[Link] and *N and HAVE-SEGMENT >> DEP[Link]. In Majorcan, where the Place autosegment is preserved because MAX[Place] is higher-ranked, the HS derivation of the input /ɲ.p/ is the following: <ɲ.p, N.p, m.p, jm.p> [see (2) and (3)]. The opaque mapping /n##ɲ/ → [ɲ.ɲ] is the optimal one because the COR autosegment of the PA-tier associated to the Coda cannot be interpreted as a glide by the vowel. This is so because, following Mascaró 1986, 1987, only a PAL autosegment, but not the others, can associate with the vowel preceding the nasal since PAL is the only Place autosegment that has exactly the same place specifications as the glide j. The other case of opacity —the overapplication of Place assimilation in Central Catalan— can also be accounted for without additional machinery. A features-as-entities approach like the one that is proposed here has more advantages than a features-as-attributes approach because the later should make use of concepts similar to rule-ordering, like OT with Candidate Chains’ (OT-CC) PREC-constraints (McCarthy 2007). Under Classic OT and the features-as-attributes approach there is no way for *ve*[ŋ] to win under any permutation of CON because the candidate 💣*ve*[n] is more faithful and is equally unmarked. In OT-CC a PREC-constraint like PREC(IDENT[Place], MAX) requiring a strict violation order between IDENT[Place] and MAX rules out a chain like *<*ve*[nk], *ve*[n]> because a violation of MAX is not preceded by a violation of IDENT[Place]. HS does not make use of PREC-constraints because candidates are not chains, so this version of OT seems to be more economic. Under the new proposal, the HS derivation of the input /n+k##/ is the following: <nk, Nk, ŋk, ŋH, ŋ>. The crucial point in this analysis relies on the fact that the effect of counterbleeding order between Place assimilation and Cluster simplification can be easily derived if McCarthy’s 2008 HAVE-PLACE is split into two different constraints: one militating against Placeless nasals, *N, and the other against Placeless stops, *H. If MAX[Link] and *H are dominated by the perceptual-oriented constraint STOP(Agree=[Pl]↔V) (Cotê 2004), which militates against assimilated stops that are not followed by a vowel, then overapplication of Place assimilation is derived with a single hierarchy (see [4]). This data and analysis also give additional support for MAX[Link] because both consonants in the cluster will share the same Place autosegment at a specific point in the derivation, so MAX[Link] must be violated at the third step of the derivation instead of higher-ranked MAX[Place].

6. Appendix.

(1) Universal fixed hierarchy (Coda-Condition$_{[NASAL]}$)

*Medial-Coda(MC)/Cor >> *Medial-Coda(MC)/Dor|Lab >> *Final-Coda(FC)/Dor|Lab >> *Final-(FC)Coda/Cor

(2) Tableaux (splitting of Coda palatal nasals in Majorcan)

First step through the Gen → Eval → Gen... loop

ɲ.p	*MC/Dor|Lab	Max[Place]	Max	Have-Seg	*N	Max[Link]	Dep[Link]
☞ N.p				*	*	*	
N.p		*!			*		
ɲ.p	*!						

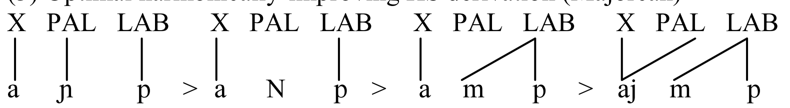
Second step through the Gen → Eval → Gen... loop

N.p	*MC/Dor|Lab	Max[Place]	Max	Have-Seg	*N	Max[Link]	Dep[Link]
☞ m.p				*			*
N.p				*	*!		
p			*!	*			
N.p		*!			*		

Third step through the Gen → Eval → Gen... loop and Convergence

m.p	*MC/Dor|Lab	Max[Place]	Max	Have-Seg	*N	Max[Link]	Dep[Link]
☞ jm.p							*
m.p				*!			
m.p		*!					

(3) Optimal harmonically-improving HS derivation (Majorcan)



(4) Tableaux (opaque interaction between Place assimilation and Cluster simplification in Central Catalan)

First step through the Gen → Eval → Gen... loop

n+k##	*MC/Cor	Have-Seg	Max[Place]	*N	Stop(Agree=[Pl]↔V)	*H	Max[Link]	*FC/Lab|Cor	Max	Dep[Link]
☞ Nk			*	*						
Nk		*!		*			*			
nk	*!									
nH	*!		*			*				
nH	*!	*				*	*			

Second step through the Gen → Eval → Gen... loop

Nk	*MC/Cor	Have-Seg	Max[Place]	*N	Stop(Agree=[Pl]↔V)	*H	Max[Link]	*FC/Lab|Cor	Max	Dep[Link]
☞ ŋk					*					*
Nk				*!						
NH			*!	*		*				
NH		*!		*		*	*			

Third step through the Gen → Eval → Gen... loop

ŋk	*MC/Cor	Have-Seg	Max[Place]	*N	Stop(Agree=[Pl]↔V)	*H	Max[Link]	*FC/Lab|Cor	Max	Dep[Link]
☞ ŋH						*	*			
ŋk					*!					
Nk				*!			*			
NH			*!	*		*				

Fourth step through the Gen → Eval → Gen... loop and Convergence

ŋH	*MC/Cor	Have-Seg	Max[Place]	*N	Stop(Agree=[Pl]↔V)	*H	Max[Link]	*FC/Lab|Cor	Max	Dep[Link]
☞ ŋ								*	*	
ŋH						*!				
NH			*!	*		*				

7. Selected References. Coté, M-H. (2004). Consonant cluster simplification in Québec French. Probus 16: 151-201. Mascaró, J. (1986). Compensatory diphthongization in Majorcan Catalan. In *Studies in compensatory lengthening*, L. Wetzels; E. Sezer (eds.). Dordrecht: Foris. Mascaró, J. (1987). A reduction and spreading theory of voicing and other sound effects. Ms, Universitat Autònoma de Barcelona. McCarthy, J. (2007). *Hidden Generalizations: Phonological Opacity in Optimality Theory*. London: Equinox Publishing. McCarthy, J. (2008). The gradual path to cluster simplication. *Phonology* 25: 271-319. Pons, C. (2005). Preconsonantal palatal segments. In *Prosodies. With Special Reference to Iberian Languages. Phonetics and Phonology Series*, S. Frota; M. Vigário; M. J. Freitas (eds.). Berlin; New York: Mouton de Gruyter.