On the asymmetrical nature of nasal obstruent relations

On the asymmetrical nature of nasal obstruent relations[1]

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0. Introduction

Much recent work concerning clusters has focussed on the interaction between nasals and obstruents in NC clusters, where N is a nasal consonant and C is an obstruent. In particular, there have been several attempts to account for the common process of postnasal voicing (Hayes 1995, Pater 1995, Itô, Mester & Padgett 1995) and the virtually obligatory nasal place assimilation in such clusters (Yip 1991, Trigo 1993, Steriade 1993, Mohanan 1993, Rice 1992, 1996, see also Ohala & Ohala (1993) for a phonetic account). In this paper I will focus on the latter phenomenon and show that current analyses cannot be explanatorily adequate since they incorrectly predict assimilation to occur in CN clusters as well.

In my account, besides drawing on available notions, such as coda licensing, I also use the following four new propositions. Firstly, sonorant consonants in rhymes reduce by shedding their consonant properties. Secondly, the consonant place class node (henceforth Cplace) dominating consonant place specifications (if present) is the property that defines segments as consonants. Thirdly, sonorant structures that lack this property are considered to be degenerate structures that cannot surface as segments. In effect, loss of the Cplace class node implies loss of the segmental status of sonorants. In contrast, obstruents without a Cplace class node are still obstruent segments, namely /ʔ/ and /h/. In §3 I will clarify the effects of a missing place class node further and also point out that a lack of place features is not the same thing as the lack of a place class node. Fourthly, consonant place assimilation does not involve the spreading of the Cplace class node or consonant place features. These are only passively involved in the assimilation process, which I claim is initiated by the assimilating segment itself. Following work in Government Phonology (Harris 1993, Blackley 1993) I argue that [coronal] is not a phonological place feature but, instead, that it is a property of phonetic implementation. Licensing requirements for place features, place class nodes or entire segments in rhymes (Itô 1986, Goldsmith 1990) and the tendency for rhymes to have sonorant material and onsets to have obstruent material (Vennemann 1972, Goldsmith 1990, Rice 1992) conspire together with the newly introduced ideas to result in the observed asymmetry.

[1] This paper has greatly benefitted from the carefull reading and comments provided by Colin Ewen, Heather Goad, Tracy Hall, Harry van der Hulst and Glyne Piggott and Keren Rice

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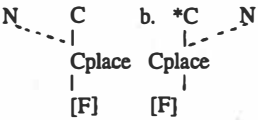
The paper is organized as follows. In §1, I present the relevant data and briefly discuss why the asymmetry is unexpected. §2 focusses on the relation between syllable positions and segment types. I discuss the relevant characteristics of debuccalisation, a process that deletes consonant place class nodes in rhymes. I will show how this process sheds light on the role of place of articulation in the relationship between segment type and syllable position. §3 addresses the notion of spreading in assimilation. §4 deals with coda licensing and further formalises the links between properties of segments and (licensing) properties of syllable positions. In §5, I discuss a case of CN assimilation in Dutch, also found in other Germanic languages and I show how it in fact supports my analysis of NC assimilation. The arguments are summarised in §6.

1. CN versus NC clusters and the matter of place assimilation

In this paper I account for the observation that in NC clusters place assimilation is almost obligatory, while this is not the case in CN clusters. This is schematically illustrated in (1), where C stands for a consonant, N stands for a nasal segment and Cplace is an organising class node for consonant place features, here indicated by [F].

(1) nasal-obstruent cluster asymmetry



In (2) some typical cases of NC place assimilation from English are presented. In (2a) monosyllabic roots are given, in (2b) bisyllabic roots and in (2c) some fast speech examples, taken from Mohanan (1993):

(2) a.	la[mp]	b.	i[mp]ut	c.	ten pounds	te[mp]ounds
	au[nt]		i[nt]ake		ten kings	te[ŋk]ings
	ba[ŋk]		co[ŋg]ress			

We see here that nasals preceding obstruents assimilate to them with respect to place of articulation. The Dutch and English data in (3) show that when nasals follow obstruents this is not the case:

(3) a.	Dutch:	knie	[kni]	*[kŋi]	'knee'
		gniffelen	[χnɪfələ]	*[χŋɪfələ]	'to chuckle, snigger'
		pneumatisch	[pnʌumatis]	*[pmʌumatis]	'pneumatic'
	b. English:	o[bn]oxious	*o[bm]oxious		
		a[kn]owledge	*a[kŋ]owledge		
		si[gn]al	*si[gŋ]al		
		a[pn]ea	*a[pm]ea		

Nasals following obstruents do not assimilate in place cross-linguistically. This fact is not as conspicuous as the obligatory place assimilation in NC clusters because (a) nothing happens, and (b) less languages have these CN clusters than NC clusters. The observed asymmetry between NC and CN is of interest because it is generally taken to be the case that assimilation takes place towards the underspecified segment. The nasals in the English examples in (2) are therefore assumed to be underspecified. In (3), the non-assimilating nasal consonants are all coronals. It has been argued in various places that coronals are underspecified for place (Steriade, 1982, Avery & Rice 1991, Yip 1991, Rice 1992, 1996, a.o.) so that we would expect assimilation also to take place towards the nasals of the CN

clusters in (3). Since assimilation is expected here, the observation that they do not assimilate is an interesting one.

The data in (4) below shed some additional light on properties of coronals. The data are from two Australian languages, Gurindji (McConvell 1993) and Arandic (Koch 1996), respectively. In Gurundji, coronal nasals in NC clusters do not assimilate, as shown in (4a). This contrasts sharply with the data in (2), and with the data in (4b) from Arandic, where both NC and CN clusters always share the same place of articulation. The Arandic data contrast with (3).

(4) a.	Gurundji (McConvell 1993)	pi**n**ka	'creek'	nyam**p**a	'what'
		ja**n**ka	woman	**ŋ**ku	'2 sg. Obj'
b.	Arandic (Koch 1996)	ap**m**e	'snake'	**mp**we	'urine'
		ak**ŋ**we	'deaf'	i**ŋk**we	'mound'
		ayt**n**e–	'fall'	u**n**te	'2sg.Erg.'

Just as in (3), the non assimilating nasals in (4a) are coronal nasals. In contrast to (3), however, we are now dealing with NC clusters rather than CN clusters. This lack of assimilation can be accounted for in terms of "licensing" as proposed in Itô (1986).The coronal nasal in /nk/ must remain underspecified, because the language does not allow for unlicensed consonant place features in the rhyme.[2] The homorganic NC clusters in the second column, then, do not arise from assimilation to underspecified nasal coronals. They share a Cplace class node in their underlying representation (cf. Itô, Mester & Padgett 1995). Assimilation takes place both in NC and in CN clusters in the Arandic data in (4b). In the case of coronals (the final row) it is either the case that the nasal and the consonant both lack a place specification, i.e. no assimilation takes place and the two segments simply get the same default interpretation, or, alternatively, coronals bear a place specification and homorganicity results from place assimilation.

The data presented so far, point to a deeper observation that underlies the observed superficial asymmetry mentioned earlier in (1). It is not simply a matter of assimilation in NC clusters and a lack of such assimilation in CN clusters. This asymmetry may be a tendency but it does not hold true across the board: the Gurundji data shows that NC clusters can be homorganic, but there are also non–homorganic NC clusters in this language. The Arandic data shows that homorganicity is required of NC clusters but also of CN clusters. In fact, the asymmetry that emerges is that given in (5).[3] The asymmetry concerns a requirement of homorganicity in clusters. The statement in (5a) is true for most languages. The statement in (5b) is true for some languages, like Arandic. Crucially, the statement in (5c) is false for all languages (indicated by' *').

(5) Observed asymmetry
a. NC clusters must be homorganic
b. All clusters must be homorganic (NC and CN)
c. *CN clusters must be homorganic

Our initial observation is actually the conclusion that we draw from the observed asymmetry in (5): assimilation in CN clusters implies assimilation in NC clusters. Nasals preceding oral consonants must therefore have some property or proprerties that makes them prone to place assimilation, which they do not have when they follow an oral consonant, i.e. in CN clusters. Comparing the data in (2) and (3) we can observe that all

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[2] Glyne Piggott pointed this out to me.

[3] Harry van der Hulst suggested to reformulate the first observation in the terms of homorganicity, which Glyne Piggott then suggested to state as in (5).

the assimilating nasals in (2) are in the rhyme, while the non assimilating coronal nasals in (3) are all in onset position. This third observation is formulated in (6):

(6) a. Assimilating nasals are in rhymes
b. Non–assimilating nasals are in onsets

In the next sections we will establish a relation between the three observations by linking together segment type (observation (1)), places of articulation (observation (5)) and syllable position (observation (6)).

2. Correlation between segment type and syllable position

2.1. Syllabifying consonant clusters

This section relates the assimilatory behaviour of nasals in NC clusters and CN clusters to different syllable positions. A nasal in an NC cluster is in the rhyme. In general, the nasal will not be syllabified as part of an onset with the following obstruent, as illustrated schematically in (7).[4]

(7) a. σ σ b. *σ σ
V N C V V N C V

A nasal in a CN cluster is an onset (with or without the preceding obstruent). It cannot be in a rhyme with the preceding obstruent, as indicated in (8).

(8) a. σ σ b. σ σ c. *σ σ
V C N V V C N V V C N V

This means that the assimilating nasals in the English examples in (2) are in the rhyme, while the non–assimilating nasals in (3) are all in onset position. The asymmetry between NC and CN clusters is thus closely linked up to the possible ways in which the clusters can be syllabified. I assume with many others, such as Hooper (1972), Vennemann (1972) among the earliest, that syllables require onsets. Onsets are maximised but must accord with syllable structure well–formedness principles (Fudge 1969, Selkirk 1982, Goldsmith 1990), such as the generally accepted principle that there is one sonority peak per syllable, a principle that is violated in (7b) and (8c).

In principle, only when the consonant is higher in the sonority scale than the nasal can an NC cluster be syllabified according to (7b). The following data from Spanish, illustrate what effect such nasal syllabification has on place assimilation. In Spanish, nasals only assimilate to glides over a word boundary (Harris,1969), as shown in (9). However, nasals are homorganic to other following consonants within lexical items as well as over word boundaries, as in *banco* ba[ŋk]o, 'bank'.

(9) a. un huevo [uŋweβo] 'an egg' b. nuevo *[ŋweβo] 'new'
un hielo [uñyelo] 'an ice cube' nieto *[ñieto] 'grandson'

[4] NC can be an onset if the language allows for nasal–obstruent contours word initially. This is the case in many Bantu languages and South American languages such as, for instance, Guaraní, as discussed in Humbert & Piggott (1997).

Vennemann (1972) argued that in the case of nasal–glide sequences word boundaries and syllable boundaries coincide. Crucially, the distinction between (7a) and (7b) is involved here. A nasal–glide sequence within a lexical item is syllabified according to (7b). If a word boundary intervenes in a nasal–glide sequence, the cluster is syllabified according to (7a), in which case the nasal must be in the rhyme. Only word internal nasal–glide sequences are syllabified according to (7b), in which case, the nasal does not assimilate and is in the onset with the glide. Apparently, in order to assimilate a nasal must be in the rhyme, just as was the case in English and Dutch (2, 3). In general then, we can say that nasals in rhymes can share place of articulation, as if they have no place of articulation of their own,whereas in onsets, they cannot, as if they already have a place of articulation.

2.2. On the nature of the Cplace constituent.

The property of rhymes that is indirectly responsible for the nasal place assimilation is the fact that rhymes enhance vowel properties and preferably shed consonant properties. This manifests itself in the fact that the least complex rhyme consists only of a vowel and also in the loss of consonant features that are only contrastive among consonants in onsets. For instance, syllable finally, obstruents devoice in Dutch and German, resulting in the neutralisation of voiced an voiceless obstruents in rhymes. In contrast, onsets enhance consonant properties. Onset consonants are often fortified with allophonic, i.e. non–contrastive features, especially word initially, as in English, for example, where word initial plosives are aspirated. Moreover, even purely vocalic segments like glides, are interpreted as consonants in onsets.

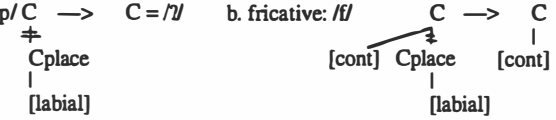
Syllable attrition is a very common process where closed syllables become short open CV syllables, so that the rhyme contains only vocalic material. This result is obtained gradually in diachronic syllable attrition. The first phase of attrition involves the loss of the consonant place class node, a process known as debuccalisation. Given the non–neutralising and consonant property enhancing nature of onsets, it will be clear that segments in onset position do not debuccalise. As argued in Chen (1979) and Trigo (1988) debuccalisation is a means of syllable attrition whereby the entire place constituent is lost. In (10) the typical effect of debuccalisation on various segment types is exemplified.

(10) debuccalisation in Malay (Trigo 1988)

ikat	—>	ika?	'to tie'
lipas	—>	lipah	'cockroach'
?awan	—>	?awẽ	'cloud'

The residue of a debuccalised segment consists of everything that remains after deletion of the place class node. Typically, of the obstruents, stops reduce to /ʔ/ and fricatives to /h/. This means that the structure of an obstruent minus its place of articulation is still a phonetically interpretable segment, namely /ʔ/ or /h/. This is schematically illustrated in (11). Dominating the Cplace constituent are stricture features and –depending on the framework used– additional features such as laryngeal features, all organised under a root node. I will label obstruent root nodes with 'C', to be interpreted as <u>obstruent</u>, parallel to McCarthy's (1988) proposal to mark sonorant segments with a feature [sonorant] in the root (see Humbert (1995) for details on this type of representation). Continuancy is indicated with '[cont]', while the arrows indicate the debuccalisation proces:

(11) a. stop: /p/ C —> C = /ʔ/ b. fricative: /f/ C —> C = /h/



In contrast to obstruents that debuccalise, the structure that remains when sonorants debuccalise cannot be interpreted as a fully fledged segment. In (12) I illustrate debuccalisation of a nasal consonant. Sonorant roots are labeled V. This label can be interpreted along the lines of the feature [sonorant] McCarthy (1988) proposes for the roots of sonorant segments. It is also closely related to Sonorant Voice or Spontaneous Voice, following the intentions of Piggott (1992), and Avery & Rice (1989, 1991) and Rice (1992), respectively.

(12) a.nasal: /m/ V —> V b. *V
| [nasal] | |
Cplace [nasal] [nasal]
|
[labial]

In the case of nasals, what remains after debuccalisation, is a latent nasal segment (Piggott 1996) that is refered to as a 'nasal glide' or 'Anusvara' in Trigo (1988) and in Humbert (1995) as a 'placeless nasal'. This latent nasal consonant cannot occur independently as a segment (Humbert 1995, Humbert & Piggott 1997), as indicated in (12b), where the residue of a debuccalised nasal is marked as an ungrammatical segment structure. Since this structure cannot surface as a segment independently, debuccalised nasals merge with preceding vowels, as in the third example in (8) (cf. Rice 1996).The resulting nasalised vowels have no consonant properties, showing that debuccalisation is a means for a nasal consonant to shed its consonant properties. A nasal consonant segment resurfaces when the latent nasal assimilates with repsect to place of articulation with a following consonant. Both these aspects of the behaviour of latent nasals can be observed in Malay. The Malay data presented in (13) shows that an underlying placeless nasal is indeed a degenerate segment that can surface as a fully fledged (consonant) segment only when it acquires a consonant place class node by assimilating to a following consonant. With its root in the rhyme, it must be syllabified in the nucleus. To acquire Cplace, necessary in order to surface as a consonant segment, it must syllabify in the onset of the following syllable. The data is from Trigo (1993) andTeoh (1988) and /ŋ/ is the placeless nasal, N:

(13) a. Malay[5] məŋ–boroŋ —> mɔ:ᵐboroŋ 'wholesaler'
məŋ–daki —> mɔ:ⁿdaki 'to climb (active)'
pəŋ–gali —> pɔ:ᵑgali 'digger'

b. m ɔ ŋ b o r o ŋ -> m ɔ ᵐb o r o ŋ
| | | | | | |
V *V C V V C
| | | |
[nasal] Cplace [nasal] Cplace
|
[labial] [labial]

We now also understand why, cross–linguistically, there are no obstruent–nasal contour segments (i.e. where the left side is oral rather than nasal) and why nasal harmony propagates leftwards. The reason is that a placeless nasal will be located in the rhyme and a Cplace component will thus be found to its right, in a following onset. Merger with the onset results in a nasal contour with a nasal leftside and an oral rightside. Its origin as a

[5] I presume a velar coda here in the sense of Trigo's Anusvara (1988), or a segment with an unspecified place class node that may be interpreted phonetically as velar, as in Rice (1996), or as a nasal without even a place class node that is interpreted as velar.

placless nasal in a rhyme will allow it to it merge with the preceding vowel on the left, thus initiating leftward nasalisation (Humbert & Piggott 1997).

In this section it was argued that the consonant defining property is the Cplace class node. Sonorants without such a node have no consonant properties. They are therefore vocalic and are structurally suitable for rhyme positions, which enhance vowel properties. However, debuccalised sonorants have no segment status. They must therefore nasalise a preceding vowel or otherwise delete. A third possiblity is to re–emerge as a fully fledged segment by sharing the Cplace class node of an adjacent consonant.

2.3. Coronals are consonants: they have a Cplace class node

It has been argued recently (Backley 1993, Harris 1993, Humbert 1996) that coronals can remain unspecified for place, so that in fact, a feature [coronal] need never be introduced into the phonology. Also from the perspective of contrastive underspecification (Steriade 1982) it will be the case that languages that lack contrastive coronal articulations, do not need to introduce a feature [coronal] until surface structure is formed, so that, in such languages, coronal specifications cannot be involved in a process like debuccalisation.

If debuccalisation was rather a matter of deleting consonant features than of deleting the entire Cplace class node, we would expect coronals to emerge as a result of debuccalisation instead of /ʔ/, /h/, and the placeless nasal (N) that we actually find. Debuccalisation never results in coronals, from which fact two important conclusions can be drawn. Firstly, the deletion of consonant **features** does not contribute to the reduction of consonant properties. If it did, it would suffice to delete a consonant **feature** and coronals would result from debuccalisation, which is, however, not the case. It follows that it is the Cplace class node that is the consonant–defining property. A second conclusion is that coronals are fully fledged consonants, even though they have no feature specification. This makes coronal segments flawless onset segments, as the English and Dutch data show, presented earlier in (3). Onsets require consonant segments and enhance consonant properties. Coronal nasals posess the consonant defining property –a Cplace class node– that is required in order to be an onset.

In contrast to coronal consonants, debuccalised segments are truly placeless segments, that have lost the property that defines them as consonants. This important difference between featureless and placeless segments is illustrated schematically in (14).[6]

(14) a.specified (/m/) V b.unspecified (/n/) V c.placeless (N): V

[nasal] Cplace [nasal] Cplace [nasal]

[labial]

In this section it was argued, based on the process of debuccalisation, that the presence of a Cplace class node defines a segment as a consonant segment. Coronals were argued to have such a Cplace class node and so they qualify as fully fledged consonants. It was further argued that since debuccalisation only takes place in rhymes, and since debuccalisation involves the deletion of the consonant property, it must be the case that at

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[6] An important and perhaps confusing difference with Rice (1996) then, is that in Rice, coronals result from filling in a default place specification in an empty Cplace class node, while without such a specification the Cplace class node may receive a velar interpretation by phonetic implementation. Rice refers to these segments that do not receive a default place specification as 'placeless', in spite of the fact that they do not lack a Cplace class node.

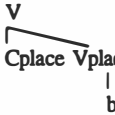
best a rhyme contains only sonorant material, such as debuccalised sonorant consonants and vowels. I therefore suggest that it is the case that sonorant consonants have a strong tendency to degenerate into placeless structures in rhymes.

2.4. The case of unstable Dutch liquids

Liquids generally do not debuccalise word finally. In Malay, /kenal/ 'to know' (Trigo 1988) is an example of a word final liquid that does not participate in the debuccalisation process exemplified in (10). Like other consonants, liquids are identifyable as consonants by their Cplace class node. Since this paper is not primarily concerned with the structural representation of liquids I will not discuss the representations in (15) at any length. It is relevant to know, however, that these representations are not intended to be universal. In other words, it could be the case that the representations for /l/ and /r/ in a language that distinguishes only these two liquids may represent an alveolar /r/ and a retroflex /ɾ/, respectively, in a language that distinguishes only rhotics.To distinguish different coronal articulations such as apicals and laminals, we can use secondary articulations in a Vplace class node, sister to the Cplace class node, as in (15bi). This allows us to differentiate between coronal articulations without having to introduce a coronal feature into the phonology (see Humbert (1995, 1996) for a detailed account of these reprsentations). Finally in (15c) I indicate that liquids are not compatible with Cplace specifications, since they are invariably coronal.

(15) a. liquid (in language distinguishing only one liquid, e.g. Japanese)

b. i. /l/ (Dutch)



ii. /r/ (Dutch)

c. liquids are not compatible with fully specified Cplace class nodes: (where [F] is a consonant place feature)

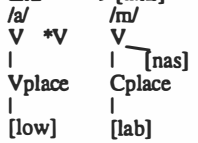
The reason why liquids do not debuccalise in word final position is that the structural residue represents either a vowel or Sonorant (or Spontaneous) Voice, which cannot surface as a segment. Whereas the residue of nasals can merge with vowel structure, giving a nasalised vowel, in the case of liquids the residue consists of material vowels already have. Merger would be vacuous and no trace of the liquid would be recoverable. As the examples from Gronings Dutch in (16) show, liquids in rhymes debuccalise before labial and velar consonants. As they are incompatible with other places of articulation (see (15c)), debuccalisation cannot be avoided by means of assimilation before consonants other than coronals, in which case, indeed, no debuccalisation takes place. This is schematically illustrated in (17).

(16)

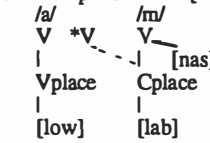
Dutch		Gronings	most Dutch dialects
arm	'arm'	[a:m]	[arəm]
kerk	'church'	[kɛ:k]/[kæ:k]	[kɛrək]
hart	'hart'	[hart]	[hart]
kort	'short'	[kɔrt]	[kɔrt]

(17) Gronings: *arm* -> [a:m] 'arm'

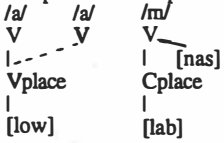
a. arm —> [a:m]



b. incompatible with [lab]

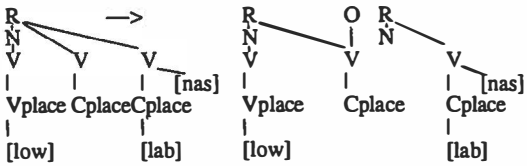


c. compatible with Vplace



In (18) it is illustrated that in other varieties of Dutch debuccalisation of /r/ is succesfully avoided by placing /r/ in an onset position by means of Svarabhakti (Schwa insertion). No debuccalisation will take place, since onsets enhance consonant properties.

(18) arm —> [arəm]
(O=onset)
(R=rhyme)
(N=nucleus)



These data illustrate the fact that consonants in rhymes debuccalise. Sonorant consonants loose their segment status this way. In order to regain this status, liquids in rhymes may assimilate to vowels with respect to place of articulation. The effect is that of compensatory lengthening. The former liquid has become a fully fledged vowel. Another strategy available to liquids is to become an onset and, so, to move away from a reduction prone environment to an environment where consonant properties are enhanced. In order to realise this option, a nucleus must be inserted after the liquid. In this process, known as Svarabhakti, the empty nucleus is realised as schwa.

In this section we have shown that consonants are reduced in rhymes in order to rid these positions of consonant material. We have established that consonant material consists of Cplace class-nodes. The presence of these class nodes in coronals makes them fully fledged consonants and therefore suitable onsets. We have shown that onsets enhance consonant properties and will not initiate debuccalisation. In short, we have related rhymes to placeless segments, consonants to onsets, coronals to consonant status and thus, by implication, coronals to onsets. In the following section we propose a strategy to avoid coronals in onsets from becoming targets in place assimilation.

3. On assimilation as spreading

In the previous section, we have established that coronals in onsets do not require place assimilation in order to maintain their status as consonant segments. At the outset of this paper it was stated that the observed asymmetry between NC and CN is of interest because it is generally taken to be the case that assimilation takes place towards the underspecified segment. Since it has been argued that coronals are not specified for place we would expect them to assimilate, even if they are otherwise fully-fledged consonants. The mere absence of a place feature would make a coronal a target for place assimilation. My proposal involves a reconfiguration of consonant place assimilation.

Whatever else is involved in the various analyses of NC place assimilation that have been proposed (Trigo 1988, Mohanan 1993, Padgett 1994, amongst many others) ultimately, place assimilation is ascribed to spreading of the consonant place component (i.e Cplace class node) or a consonant place feature from the obstruent to the nasal. Whether

consonant place features may spread has been related to the presence or absence of a suitable landing site in the target structure (for exploitation of this idea see e.g.Kiparsky 1985, Avery & Rice 1991, Piggott 1992). If we allow the availability of a landing site to be the criterion that determines the possibility of spreading, two problems arise. The first problem is that the availability of a landingsite cannot be formally related to the directionality of spreading. In (19a,b) I illustrate leftward place assimilation in NC clusters by spreading a Cplace feature (a) or a Cplace class node (b). In (19c,d) the unattested rightward spreading in CN clusters is illustrated.[7] There is no formal or structural difference between the participating segments in (19a,b) and (19c,d) that relates to the directionality of spreading. (Arrows indicate the result of assimilation)

(19) a. /n/ /p/ b. N /p/ c. /p/ N d. /p/ N
V C V C C V C V
| [nas] | | [nas] | | [nas]
Cplace Cplace [nas] Cplace Cplace Cplace [nas]
| | | | |
/m/ [labial] /m/ [labial] [labial] */m/ [labial] */m/

The second problem attached to using availability of a landingsite as a criterion for spreading is that it does not allow us to grasp the difference between the nature of consonant place assimilation and vowel place assimilation because, essentially, it proposes to account for both in a unified way. However, the two processes differ in some very basic respects. For instance, in the case of vowel place assimilation, features may spread to segments that are already specified, while this is never the case with consonants. In Turkish, for instance, both round and non-round vowels are targeted by spreading [front] or [back], depending on the point of view. Characteristic of consonant place assimilation is that it only takes place if the assimilating segment lacks a Cplace class node, or, rarely, when it lacks Cplace features. Consonant place assimilation, as opposed to vowel place assimilation is therefore determined entirely by the nature of the target. In effect, the process is independent of the nature of the consonant that provides the Cplace class node, its only essential characteristic being that it has such a node. In view of these observations I suggest, following Humbert (1995), that instead of regarding consonant place assimilation as a process where a Cplace class node spreads, it is more to the point to view it as a process where a placeless segment 'snatches' a Cplace class node from a neighbouring segment by latching onto it. The term 'snatching' is chosen to emphasise that the initiative lies with the assimilating structure rather than with the consonant that provides Cplace. The non-assimilating coronal nasals in onset positions can now be left unspecified since if assimilation does not involve spreading, they cannot be targeted. Hence, unless they 'snatch' a place feature, they will remain as they are.

4. Cluster Well-Formedness Constraints

4.1. The paradox of sonorant consonants in rhymes

It is difficult to establish the underlying representation of NC clusters since they obligatorily assimilate. Thus, they could either be lacking an entire place component or their input form could contain a homorganic cluster, in which case it is not a matter of assimilation but of underlying partial geminated structures (cf. Itô, Mester & Padgett, 1995). In (20) these options are illustrated with the word 'lamp'. In 20c), no spreading takes place; all structure here is assumed to be present in the underlying representation.

[7] Languages such as Arandic appear to be exceptional in this respect. However, it could well be the case that in these languages, where both NC and CN clusters are homorganic, clusters have multiply linked Cplace class nodes in their imputs, so that, in fact, no assimilation takes place at all.

(20) a. l a N p
V C
[nasal] Cplace
[labial]

b. l a N p
V C
[nasal] Cplace Cplace
[labial]

c. l a m p
V C
[nasal] Cplace
[labial]

If we adopt the view proposed here that coronals are characterised by a Cplace class node without place features and where consonant place assimilation is due to 'snatching' rather than spreading, the non-assimilating nature of coronal nasals is accouned for. The need for placeless sonorants to assimilate now becomes clear: they have no segment status unless they have a Cplace class node. The question that remains to be answered concerns this paradox: if sonorant cosnonants reduce in rhymes, then why should they assimilate, acquiring a Cplace class node once again. Sonorants in rhymes are indeed in a paradoxical situation: their prosodic position requires them to shed their consonant properties, while, at the same time, as potential segments they aspire to surface as such. The key to the paradox lies in the notion of licensing, the subject of the next section. A sonorant consonant in the rhyme has an unlicensed Cplace class node, unless it is licensed by the following onset (cf Itô 1986, Goldsmith 1990).

4.2. On the notion of coda licensing

Many languages –if not most– allow only for non–specified segments or sonorants word finally, and homorganic clusters or true geminates word internally. This cross–linguistic state of affairs is discussed in e.g. Yip (1991) and Rice (1992). The restrictions on word–final consonants are related to the fact that in that position, the consonant in the rhyme -the coda- is not 'licensed' by a following a segment.[8] Steriade (1995) formulates licensing with an emphasis on the licensing nature of onsets as in (21), where underscore is mine (cf. Itô 1986, Yip 1991).

(21) [a F], where F is a consonantal point of articulation feature must be licensed, *in at least one associated segment*, by membership in the onset.

The formulation of (21) can be adapted to extend to any non-sonorant property in a rhyme, i.e. not only Cplace class nodes but also C roots and obstruent stricture features such as [continuant].[9] In other words, these properties are only acceptable in rhymes if they are also structurally part of a following onset. Gemination is then a means of licensing (cf. Itô, 1986). If Cplace is shared by a fricative in the rhyme and a stop in the following onset, the consonant place feature is licensed but the dominating manner component is not. If the language in question only requires Cplace to be licensed the cluster is well-formed. If, however, all non-sonorant properties in rhymes must be licensed, the cluster will not be acceptable in spite of the fact that Cplace is licensed. Languages may thus vary to the extent in which the structural constituents of segments require licensing. The necessary

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[8] I have assumed that rhymes may branch into a nucleus and a position that is generally refered to as 'coda' (Steriade 1982, Itô 1986, and Yip 1991). So far, we have simply refered to this position as being in the rhyme but not in the nucleus. Nothing much hinges on the terminology nor on the syllable structure framework adopted. I simply wanted to avoid a lengthy discussion on the pros and cons of various approaches. Essentially, only the difference between onsets and rhymes is relevant to this paper.

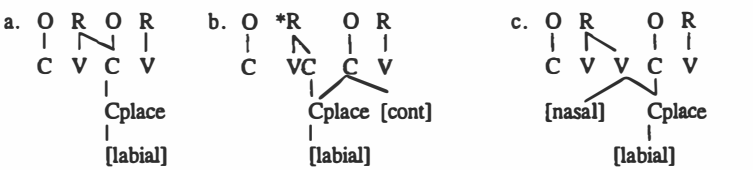
[9] I refer the reader to Anderson & Ewen (1987), van der Hulst (1994) Humbert (1995) for proposals that allow us to express in a unified manner that continuancy is an obstruent property while nasality is a sonorant property.

parameters can be formalised as in (22a).[10] In (22b), the rows give the various options and the first two columns give the parameter settings. The last column gives, for each row, the type of language that results from that specific parameter setting. Of these options only the first three surface. The relevant configurations are illustrated in (23).

(22) a.i. License Cplace (LCpl: on/off) i.e. only Cplace constituent licensed
ii. License Croot (LCr: on/off) i.e. the entire segment licensed

b.i.	LCr: off	LCpl: off	-syllables may be closed with any type of segment in the coda (English, Dutch)
ii.	LCr: off	LCpl: on	-only /l/, /h/ and N codas are allowed in unlicensed word final position. Word internally place needs to be geminated (Malay)
iii.	LCr: on	LCpl: on	-only nasalization word finally, no /l/, /h/ (French). Internally homorganic sonorant–obstruent clusters geminated obstruents
iv.	*LCr: on	LCpl off:	-if root needs to be licensed, so does Cplace, due to segment structure
v.	LCr/LCpl:	n.a.	- language has only CV and CVV syllables

(23)



Place & Root licensed by gemination

Root not licensed. Place licensed by onset (gemination of Place)

No root licensing required Place licensed by gemination with onset

If a segment is entirely geminated a place feature need not be licensed separately since it is structurally linked to the following onset by inheritance. It follows that if a language requires C roots to be licensed, the Cplace constituent it dominates must also be licensed. Given the fact that NC clusters (23c) are virtually obligatorily homorganic, it is conceivably the case that the word internal Cplace class node is doubly linked in the input representation to begin with. Some languages like e.g. English, with words such as flask ending in two obstruents, of which the second definitely has a place feature, do not need their codas to be licensed by following onsets. In spite of this fact, homorganicity of NC clusters is nevertheless obligatory in such languages. Hence, the assimilation asymmetry cannot simply be a matter of coda licensing alone. Moreover, if a language allows for non–licensed obstruent codas, it also allows for non licensed nasals and laterals. The reverse is not true: Japanese (Itô, 1986) only allows for placeless nasals word–finally and for entirely licensed codas word internally, i.e. geminates:

(24) English: ham, man, hang
Japanese: teppoo 'pistol', tombo 'dragon–fly', tor–te >totte 'taking', *topno

[10] In addition to the settings given in (22a) there can also be a lincensing requirement on Cplace **features**. If a languages requires that only features be licenced, as in e.g. Greek, it will allow coronal consonants in codas besides /l/, /h/ and N, geminates and hormorganic nasal-obstruent clusters. It will, however, not allow labials or dorsals to occur in this position. I do not include this licensing parameter setting in (22) as listing all the resulting possible combinations distracts the attention away from the main point.

The present account combines segmental well-formedness and syllable structure well-formedness together with licensing parameters on non-vocalic segment structures in the rhyme. This approach can deal with the fact that only sonorant consonants place class nodes need to be licenced, while their root does not. Sonorant consonants are segments by virtue of a place constituent. Lacking place, a nasal can surface as nasalisation on a preceding vowel or assimilate to a following consonant, in which case it acquires segment status. In that case, the place constituent will be licensed because it is associated to a segment in onset position. In this respect languages like English and Japanese are alike: although Japanese requires coda segments to be licensed with respect to all non-vocalic properties, English requires that nasals in the rhyme surface as consonants, since English does not have vowel nasalisation (except phonetically). This results in a similar gemination pattern in the case of syllable final nasals in both languages, as was exemplified in (24). Presumably, the primary motivation for assimilation in Japanese is that segment roots should surface as a segment, if possible. This would motivate a latent nasal to acquire a Cplace class node.

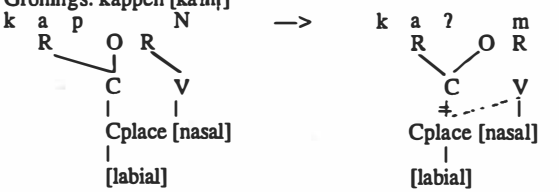
5. The case of Gronings Dutch

As in German (and sometimes in English), in Gronings, a Dutch dialect, the nasal of the plural and infinitive suffix –en assimilates to a preceding consonant. The suffix –en consists of an empty nucleus and a placeless nasal (Humbert, 1996). Examples are provided in (25a). In (25c) the structural representation is presented of kappen. The nasal structure fills the empty nucleus, at the same time becoming adjacent to a specified obstruent that can provide a Cplace node. The nasal will thus acquire segment status.

(25) a.

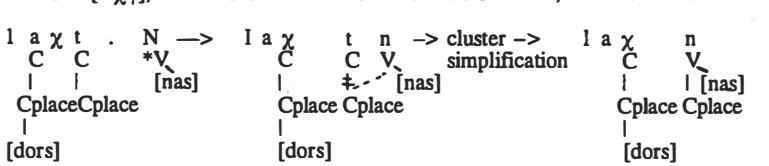
		Groningen	Holland
kappen	'to chop'	[kaʔm̩]	[kap:ə]
eten	'to eat'	[e:tn̩]	[e:tə]
b. lachten	'laughed(past.pl)'	[laχn̩]*[laχŋ]	[laχtə]
lachen	'to laugh'(pr. pl.)	[laχŋ]	[laχ:ə]

c. Gronings: kappen [kaʔm̩]



Eventhough an assimilating CN cluster surfaces, in Gronings the nasal originates in the rhyme of the following syllable, so that in fact, we are dealing with a derived CN cluster. In agreement with the observation given in (6), nasals in rhymes reduce and assimilate to an adjacent consonant, in order to acquire segment status. In this case the consonant providing the Cplace class node happens to precede, rather than follow the nasal. In most Dutch dialects the nasal is simply dropped. In (26), I schematically illustrate how in (25b) the surface form [laχn̩], with a coronal nasal instead of a dorsal nasal, can be derived.

(26)



The examples in (25b) and the illustration in (26) demonstrate that coronals do not require any consonant place features and that consonant place features do not spread. This lack of assimilation can be explained if we regard the assimilation as the appropriation of a place component by the nasal rather than as a geminate construction involving double linking. It would seem that the cluster simplification resulting in /t/ loss can only occur if /t/ is /ʔ/ by loss of a place component that now belongs to N, a segment carrying morphological information that cannot be deleted. The presence of /t/, a past tense morpheme, is still recoverable from the lack of assimilation between /χ/ and the nasal. In this way, /t/ leaves a phonological trace.

6. Summary

In this paper I have shown that an intricate relation exists between the properties of segments and their prosodic positions. Since in e.g. English a coda need not be licensed, obligatory place assimilation in NC clusters cannot merely be attributed to coda licensing Rather, it was suggested here, place components of sonorant manner components in rhymes should be licensed, irrespective of whether the languages requires coda–licensing as well. If the language requires such licensing, as in e.g. Japanese, this will have the same effect where sonorants are concerned. The difference will be that in such languages obstruents in codas cannot be licensed. Languages with coda licensing were further said to be subdivided into languages that only require the place component to be licensed, in which case /ʔ/ and /h/ in the coda are tolerated. Other languages require the entire coda to be licensed. In such languages obstruents must either geminate or be deleted, while usually, sonorant manner components are acceptable in the rhyme.

The lack of assimilation of nasals to preceding obstruents in CN clusters was ascribed to the fact in these cases the nasals are in onset position. They are therefore by definition fully fledged consonants. A coronal consonant can be left unspecified in this approach because we argued that consonant place features do not spread. An unspecified Cplace constituent will therefore remain as it is and it will be interpreted as coronal. In addition, we argued that since in the case of debuccalisation entire Cplace constituents are removed, rather than just place features, the loss of such features does not contribute significantly to the loss of consonant properties. Coronal consonants can, therefore, be represented with unspecified Cplace class nodes.

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