Phonology **19** (2002) 441–458. © 2002 Cambridge University Press
DOI: 10.1017/S0952675703004421 Printed in the United Kingdom

Squibs and replies

*Labial unmarkedness in Sri Lankan Portuguese Creole**

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In this squib we introduce new language data into the debate concerning the markedness of place of articulation. The data illustrate a process of assimilation in Sri Lankan Portuguese Creole where coronal patterns as more marked than both labial and dorsal. Labial unmarkedness is further supported by the feature's asymmetrical patterning in consonant deletion as well as its distribution and frequency. The patterns are of particular significance since they provide a clear example of a language in which labial patterns as unmarked, thus leading us to the conclusion that there is no single, universal unmarked place of articulation. Implications of the Sri Lankan Portuguese Creole pattern for structure- and constraint-based accounts of markedness are discussed.

1 Introduction

One of the more controversial issues in phonological theory centres on what the unmarked place of articulation is for consonants. Some assume that it is coronal (e.g. Kean 1975, Kiparsky 1985, Avery & Rice 1989, Paradis & Prunet 1991a, Mohanan 1993, Prince & Smolensky 1993, Hume 1996, Wilson 2001), while others suggest velar (e.g. Trigo 1988). Rice

* We owe a debt of gratitude to Ian Smith for making his electronic database of SLPC available to us and for answering our many questions over the last few years concerning the phonology of the language. Earlier versions of this paper were presented at the Mid-Continental Workshop on Phonology (1999), the Montreal–Ottawa–Toronto Workshop on Phonology (2000) and the Department of Linguistics, University of Tromsø (2001). We thank the members of those audiences for their valuable input, in particular José Hualde, John McCarthy, Charles Reiss, Curt Rice and Keren Rice. We are also grateful to Mary Bradshaw, Nick Clements, Keith Johnson, Brian Joseph, David Odden and Donca Steriade for their comments and suggestions. Finally, we extend our sincere appreciation to the members of the OSU seminar on markedness, 2002 (Catalin Anghelina, Hope Dawson, Shelome Gooden, Grant McGuire, Jeff Mielke, Misun Seo and Andrea Sims), as well as to the three reviewers and associate editor, who provided much critical input on an earlier version of this paper.

(1996) makes the case for both coronal and velar as unmarked.[1] While there is little consensus as to which place of articulation, if any single type, is unmarked universally, most would agree on one point: labial is never the unmarked place of articulation for consonants.

In this squib we present data from Sri Lankan Portuguese Creole (SLPC) which illustrate precisely such a case. The evidence comes from the asymmetrical patterning of consonant place of articulation in assimilation where labial patterns as unmarked. This finding is further supported by the pattern of consonant deletion as well as by the distribution and frequency of consonant place in the language. As we discuss below, drawing on the asymmetrical patterning of features or sounds as a diagnostic for markedness is common practice in phonology. With respect to assimilation, for example, the underlying assumption is that an unmarked feature behaves as a target, or undergoer, of assimilation while a marked feature does not. The extent to which this and other diagnostics are appropriate measures of phonological markedness is an important question, yet one that goes beyond the scope of this paper. Rather, our goal is simply to show that by drawing on the same class of evidence commonly used to determine the unmarked status of other consonant places, the SLPC pattern leads us to the conclusion that there is no single, universal unmarked place of articulation.[2]

2 Featural asymmetry as a diagnostic for phonological markedness

It has long been assumed that phonological criteria for determining markedness relations can be established on the basis of the asymmetrical patterning of features or sounds in inventories and phonological processes (see, among many others, Trubetzkoy 1939, Archangeli 1984, Kiparsky 1985, Pulleyblank 1988, Avery & Rice 1989, Paradis & Prunet 1991a, Rice 1999). As Rice notes, when comparing features within a class, one feature may pattern asymmetrically; this feature is deemed the unmarked member of the relation. For example, Archangeli (1984) points out that although Yoruba counts three tones in its tonal inventory (High, Mid, Low), the Mid tone, unlike High and Low, never appears in the structural descriptions and changes of phonological rules.[3] In this case, the Mid tone patterns asymmetrically from the other members of the tonal class and is

[1] Lombardi (2002) argues for laryngeal as unmarked.

[2] The data introduced in this paper raise many questions relating to markedness, including, among others, the status of markedness in linguistics, the identification and reliability of markedness diagnostics and the role of native language knowledge in the development of markedness patterns. Each of these issues is important and merits careful consideration and debate. Endeavouring to undertake this task clearly exceeds the modest goals of this squib. See, however, Battistella (1990), Rice (1999), de Lacy (2002), Hume (2002), among many others, for related discussion.

[3] Akinlabi (1985) and Laniran (1992) argue that Mid tones form contours in the postlexical phonology.

thus considered the unmarked member. Asymmetry can also be found in the language's segmental phonology: phonological rules consistently treat /i/ differently from other vowels in the language, which is taken to provide support for the unmarked status of the features distinguishing /i/ from other vowels in the system (Pulleyblank 1988).

Asymmetries can arguably be observed in any type of phonological process including assimilation, the process most relevant to our discussion of SLPC in the following section. When comparing members of a feature class in assimilation, it is commonly assumed that 'the unmarked pole of an opposition is lost or obscured, with the marked pole remaining … In assimilation, the marked features within a class are active … the unmarked features, on the other hand, are passive, or inert – these … are overridden by other features' (Rice 1999 (Part 1): 4). Put another way, marked features resist modification while unmarked features are subject to change.

To illustrate, consider place assimilation in Korean, a frequently cited example (Iverson & Kim 1987, Jun 1995).

(1) *Korean place assimilation*

a.	/mit+ko/	[mikk'o]		'believe and'
	/mit^{h}+pota/	[mipp'ota]		'more than the bottom'
b.	/ip+ko/	[ikk'o]		'wear and'
	/nop+ta/	[nopt'a]	*[nott'a]	'high'
c.	/nok+ta/	[nokt'a]	*[nott'a]	'melt'
	/kuk+pota/	[kukp'ota]	*[kupp'ota]	'more than soup'

In Korean, a final obstruent stop assimilates in place to a following consonant, with the following restrictions. As shown in (a), a morpheme-final coronal assimilates to a following velar or labial consonant. In (b) it can be seen that a morpheme-final labial also assimilates to a following velar, but fails to assimilate to a following coronal. As the two examples in (c) show, a final dorsal consonant does not assimilate to either a following labial or coronal consonant. According to the view that markedness is correlated with resistance to modification, the dorsal consonant is considered most marked, followed by the labial, then coronal.

With this as a basis, we turn to a discussion of the patterns observed in Sri Lankan Portuguese Creole.

3 Place asymmetries in Sri Lankan Portuguese Creole

The focus of this section is on place asymmetries in nasal consonants in the Batticaloa variety of Sri Lankan Portuguese Creole and their relevance to the place-markedness debate.[4] First, however, we offer some relevant background concerning the language and its phonological system.

[4] We have not identified phonological processes involving oral consonants in SLPC that would provide evidence for the markedness status of their place of articulation.

The data used in this study are from Smith's (1978) grammar, supplemented by an on-line database of 2500 words kindly provided to us by Ian Smith. At the time Smith wrote his grammar, Sri Lankan Portuguese Creole was spoken on the east coast of Sri Lanka by about 2500 people. In addition to Portuguese's strong influence on the development of the creole, SLPC was influenced by Dutch and English, due to the occupation of the region by the Dutch beginning in the early 1600s and the British starting at the end of 1700s. Moreover, since most speakers are bilingual in either Tamil or Sinhalese, these languages have a continuing effect on the creole.

For reference, the language's phoneme inventory for consonants is given in (2).

(2) *The phonemic consonant inventory*

labial	labio-dental	dental-alveolar	palato-alveolar	palatal	velar
p b		t d			k g
			ʧ ʤ		
	f	s z			
m		n		ɲ	ŋ
		r			
		l			
w				j	

Note that nasals occur contrastively at labial, dental-alveolar, palatal and velar places of articulation. However, not all types occur in all contexts, as shown in (3). In word-initial position, only [m] and [n] occur. Intervocalically, all nasals can be found.[5] Word-finally, only [m n ŋ] occur, though [ŋ] is found in only a small number of words in this context, the majority being loanwords. We return to these distributional observations further below.

(3) *word-initial*	*intervocalic*	*word-final*
[m n]	[m n ɲ ŋ]	[m n ŋ]
mael 'honey'	kumijam 'communion'	paːm 'bread'
noːs 'we'	penera 'sift'	siːn 'bell'
	laeːɲə 'firewood'	
	uŋə 'one'	miːtiŋ 'meeting'

Nasal–obstruent clusters also occur, as illustrated in (4). Within morphemes, members of a cluster must be homorganic.

[5] A retroflex nasal occurs in free variation with the dental-alveolar following non-high back vowels ([o(ː) ə a]). The lateral /l/ also has a retroflex allophone occurring under the same conditions as its nasal counterpart.

(4) *Morpheme-internal* NC *clusters*

liːmpu	'clean'	poːmbə	'dove'
oːntə	'yesterday'	oːndə	'wave'
iɲʧə	'draw'	uɲʤuwej	'knee'
briːŋken	'game'	liːŋgu	'tongue'

Across word and morpheme boundaries, the situation is more interesting. In this context, a labial or velar nasal systematically assimilates to the place of articulation of a following consonant, while a coronal nasal remains unchanged. Consider the data in (5). The forms in (5a) illustrate monomorphemic words ending in either a labial or velar consonant. When the genitive singular suffix /su-/ is added, as in the second column, both the labial and velar assimilate to the place of articulation of /s/. The velar also assimilates to a following labial, as illustrated in the third column with the addition of the dative suffix /pə/. In verbal nouns, a final labial assimilates to a following velar consonant. However, as shown in (5b), the coronal /n/ resists assimilation to both a labial in the third column and a velar in the fourth. Additional examples of assimilation involving the labial and velar are provided in (5c). Examples have also been included, when available, of word-final nasals followed by a vowel, thus attesting to the underlying status of the nasal's place of articulation.[6]

(5)

	nom sg	*gen sg*	*dat sg*	*verbal noun*	
a.	vaːrzim	vaːrzinsu	vaːrzimpə	vaːrziŋki-	'harvest'
	rezaːm	rezaːnsu	rezaːmpə	rezaːŋki-	'reason'
	miːtiŋ	miːtinsu	miːtimpə	miːtiŋki-	'meeting'
	maːm	maːnsu	maːmpə	maːŋki-	'hand'
	cf. [eli maːm ebeːrtu] 'he+hand-open = He is a spendthrift.'				
b.	bataan	bataansu	bataanpə	bataanki-	'button'
	siːn	siːnsu	siːnpə	siːnki-	'bell'
	tavn	tavnsu	tavnpə	tavnki-	'town'
	kəlkuːn	kəlkuːnsu	kəlkuːnpə	kəlkuːnki-	'turkey'
	siloːn	siloːn	siloːnpə	siloːnki	'Sri Lanka'
	cf. [siloːn avara taantu defreːnsa teem] /siloːn avara … / 'Sri Lanka is now very different.'				

[6] A reviewer raised the issue of how the labial nasal came to be unmarked in SLPC, given the common assumption among phonologists working on Portuguese that coronal is unmarked in that language. It is important to keep in mind that while Portuguese was the superstrate language, Portuguese rule of the island ended in 1658, leaving the creole to develop independently since that time. It is not unreasonable to think that the patterning of the labial in SLPC could have been influenced by the substrate languages (Sinhala and Tamil) or by some other language, or that it could have emerged independently, with the Portuguese-based words conforming to the new pattern, rather than *vice versa*.

c. pikini:m+ka:zə [pikiniŋ ka:zə] 'small+house = small house'
reza:m+lej [reza:n lej] 'reason+like = reasonably'
uŋ+fa:kə [um fa:kə] 'one knife' cf. [uŋ a:nu] 'one year'
uŋ+di:j [un di:j] 'one day'
pərim+təsuwa: [pərin təsuwa:] 'me+sweat = I am sweating.'
cf. [pərim uŋ ga:rfu ta:n tri:ja] /pərim uŋ ga:rfu ta:m tri:ja/
'me-DAT a fork also bring = Bring me a fork too.'

The observed pattern of place assimilation in Sri Lankan Portuguese Creole is of particular interest, given the commonly held view that the asymmetrical patterning of features in assimilation serves as a diagnostic for a feature's markedness. The observation that coronal alone resists assimilation leads us to conclude that labial and dorsal are the least marked places of articulation for nasals, while coronal is the most marked.

The patterning of labial as unmarked is also supported by nasal deletion patterns in the language. In treating deletion as a diagnostic for markedness, it is generally assumed that 'marked features within a class are maintained and unmarked features lost' (Rice 1999 (Part 2): 4). Interestingly, a word-final labial consonant is optionally deleted in SLPC before a word beginning with a vowel or /j/, and less frequently before a pause; nasalisation is realised on the preceding vowel, e.g. [əkə ta:m] ~ [əkə tã:] 'that too', [əmijam otər di:jə] ~ [əmijã otər di:jə] 'the day after tomorrow'. Non-labial nasals do not delete, e.g. [silo:n avara] *[silõ: avara] 'Sri Lanka now', [uŋ a:nu] *[ũ a:nu] 'one year' (Smith 1978).

Distribution and frequency also point to the labial nasal as unmarked. Proponents of the view that distribution and frequency provide evidence for markedness generally assume that unmarked segments (or features) should have a wider distribution and occur more frequently within a language (see e.g. Trubetzkoy 1939, Greenberg 1966, Battistella 1990, Stemberger 1992, Bernhardt & Stemberger 1998; for related discussion, see Rice 1999). With respect to distribution, it will be recalled from (3) that labial and dental-alveolar nasals have the widest distribution, occurring word-initially, intervocalically and word-finally (all consonants occur before a homorganic nasal morpheme-internally).[7] The velar nasal occurs intervocalically and word-finally, while the palatal occurs only word-medially. Distributional considerations thus lead us to treat labial and coronal as least marked, followed by velar, then palatal. According to available (type) frequency data, the labial nasal is revealed as most frequent and, assuming the link between frequency and markedness, can be consider least marked of all nasals in the language. Given the distributional facts, it is not surprising that in Smith's 2500 word database of SLPC words, [m] and [n] have the highest type frequency among nasals in the language: word-initially, [m] occurs 141 times while [n] occurs 40 times; word-finally, [m] occurs 112 times and [n] occurs 64 times; and in intervocalic position [m] and [n] occur 97 and 83 times, respectively. Type

[7] Since the retroflex is an allophone of the dental-alveolar nasal, the two have been subsumed under a single category.

frequency clearly sets [m] apart as the most frequent and thus least marked.[8]

To summarise, in this section we have drawn on a number of common diagnostics for markedness to establish the unmarked status of place of articulation among nasals in SLPC. The following hierarchies have emerged (for simplicity, we only include the results for labial, coronal and dorsal):

(6)

Diagnostic	*Less marked*		*More marked*
assimilation	labial/dorsal	>	coronal
deletion	labial	>	dorsal/coronal
distribution	labial/coronal	>	dorsal
frequency	labial	>	coronal > dorsal

One result is clear: labial is the least marked nasal in the language, patterning as unmarked in all four categories. No clear pattern emerges with respect to the coronal and dorsal, however: dorsal is as unmarked as labial with respect to assimilation, while coronal patterns with labial when it comes to distribution. Frequency puts coronal ahead of dorsal, although in deletion they are treated in a similar manner.

4 Implications for formal approaches to markedness

We turn now to the implications of the above findings for formal models of phonology. The observations from SLPC suggest that in addition to allowing for coronal and velar to be unmarked in a system, an adequate model must also predict unmarked labial. As we briefly outline just below, whether the model is structure- or constraint-based, greater formal flexibility seems warranted when it comes to characterising the unmarked place of articulation.

4.1 Structure-based markedness

A fundamental assumption of structure-based approaches to markedness is that there is a positive correlation between structure and markedness: the more structure a representation has, the more marked the segment being represented is (see e.g. Archangeli 1984, Kiparsky 1985, Sagey 1986, Avery & Rice 1989, Rice 1996). Furthermore, a single member of a class is singled out as unmarked and is thus least specified. For example, Kiparsky (1985) argues that coronal nasals are unmarked for place in Catalan since only coronals assimilate to the place of articulation of any following consonant (Mascaró 1976). This observation is formally encoded in phonological theory by means of underspecification: only marked features are underlyingly specified. As is no doubt evident, the

[8] As noted above, excluding preconsonantal position, the type frequency of the velar nasal is very low. Frequency information is not available for the palatal.

observed patterns in SLPC pose a serious problem to this type of approach given that both labial and dorsal undergo assimilation, and so both would be considered unmarked. Clearly, it is impossible to characterise both as least specified.

The data are also problematic for models which incorporate degrees of markedness into the representation. Rice (1996) proposes such a model which we provide in simplified format in (7), with coronal, labial and dorsal places of articulation represented.

(7) a. *Underlying coronal*

Place

b. *Underlying labial*

Place

|

Peripheral

c. *Underlying dorsal*

Place

|

Peripheral

|

Dorsal

Coronal is characterised as unmarked in (7a), represented with only a Place node. Labial bears a Peripheral node, making it structurally more marked than coronal. The most marked place of articulation is assumed to be dorsal, which has all of the structure of the other two places in addition to a Dorsal node.[9] A key assumption of this model is that assimilation is structure-building; a less specified representation is predicted to be a more likely target for spreading than one with more structure. Given this, the model is able to correctly predict place assimilation in Korean (Iverson & Lee 1995): a coronal is reported to assimilate to a following dorsal or labial, a labial only to a dorsal, while dorsals are assumed to be non-targets. Nonetheless, the model is too restrictive, given the underlying assumption that labial can never pattern as unmarked.[10] The fact that it can suggests the need for a less rigid view of what can and can not occur as unmarked in language. In fact, the observation that all places of articulation can surface as unmarked, as we confirm below, leads us to conclude

[9] Though not illustrated in (7), Rice also assumes the existence of velar place, which is claimed to differ both representationally and phonetically from the dorsal in (7c). Like the coronal, it may surface as unspecified for place (see e.g. Paradis & Prunet 1991b, 1994 for critical discussion of velar underspecification). This aspect of the theory allows for language-specific variability concerning the unmarked consonant; either coronal or velar may be unmarked, depending on the language. Archangeli (1984) (following Trubetzkoy 1939) goes one step further, and argues that markedness is determined on a language-specific basis. This claim is consistent with the conclusions drawn in this paper.

[10] One might attempt to reformulate the feature organisation in (7) to account for the SLPC facts. For example, one might assign the most structure to coronal, less structure to dorsal and the least structure to labial. However, as aptly pointed out by a reviewer, this is an unworkable solution since it incorrectly predicts an asymmetry between /m/ and /ŋ/: labial assimilates to dorsal but not *vice versa*.

that markedness considerations do not provide compelling motivation for arguments concerning the structural representation of place features.

4.2 Optimality Theory: fixed constraint rankings

Markedness considerations also figure prominently in optimality-theoretic analyses. While OT constraints are generally assumed to be freely rankable as a means of encoding cross-linguistic variation, universally fixed rankings are commonly used as a means of formally expressing markedness relations. For instance, Prince & Smolensky (1993: ch. 9) formalise the view that coronal is unmarked with respect to labial by means of the harmonic ranking in (8a) (the arrow is interpreted as imposing a universally fixed ranking). The harmonic ranking is translated into the fixed constraint ranking in (8b), which, informally stated, expresses the claim that labial is more marked than coronal.

(8) a. *Harmonic ranking of place*
PLACE/Lab ≻ PLACE/Cor
b. *PLACE/Lab ≫ *PLACE/Cor

A fixed ranking of place features implies that markedness relations among these features are universally determined. That is, a single ranking of place features forms part of the grammar of all speakers of all languages. Despite the assumed universality of such rankings, the theory also provides a means of expressing the observation that a given feature need not be unmarked in all languages: an additional constraint may dominate the fixed ranking, thus having the effect of overruling the unmarked status of a lower-ranked constraint (see e.g. Lombardi 2002 for analyses along these lines). This points to an important difference between the structural model discussed above and the OT approach to markedness: there is nothing in OT that expressly rules out labial from surfacing as unmarked. In fact, given that any number of constraints can dominate the fixed ranking of place features, any feature could, in principle, pattern as unmarked. Given this, we question the need to include a universal fixed ranking of place features in the first place. As we show just below, by assuming place constraints to be freely rankable (see also Fonte 1996), we correctly predict observed patterns of place assimilation, both in SLPC and beyond.

4.2.1 *A preliminary OT account of place asymmetries in SLPC.* We begin by sketching out a possible OT analysis of the SLPC patterns discussed above.[11] As we show, the analysis is straightforward, given the assumption that the ranking of place constraints is not universally fixed. This

[11] See de Lacy (2002) for an OT analysis of the assimilation patterns in SLPC, based on data presented in an earlier version of this paper.

approach also makes correct predictions concerning the patterning of consonant place cross-linguistically, as we briefly outline in the following section.

Consider first the analysis of place assimilation in SLPC. For this we draw on the PRESERVE family of constraints proposed in Steriade (1997). As our definition in (9) suggests, the constraint is similar to the MAX family of constraints proposed by McCarthy & Prince (1995), the primary difference being that MAX refers to segments while PRESERVE refers to features. Three constraints from this family are relevant for the present analysis: PRESERVE[cor], PRESERVE[dors] and PRESERVE[lab]. A constraint is violated if a place specification of the input is absent in the output.

(9) PRESERVE[F] (*preliminary version*)
A feature in the input has a correspondent in the output.

A successful account of SLPC place assimilation necessitates the ranking in (10). Informally stated, it is more important to preserve coronal than it is to preserve dorsal or labial.[12]

(10) PRESERVE[cor] ≫ PRESERVE[dors], PRESERVE[lab]

Since an unfaithful mapping of input to output only occurs in response to a more highly ranked constraint, we make use of the Identical Cluster Constraint for place: members of a consonant cluster must be homorganic (Pulleyblank 1997).

(11) a. IDENTICALCLUSTERCONSTRAINT[place] (ICC[place])
Consonant clusters are homorganic.
b. PRESERVE[cor] ≫ ICC[place] ≫ PRESERVE[dors], PRESERVE[lab]

Finally, to capture the generalisation that it is more important in SLPC for clusters to be homorganic than for a labial or dorsal consonant to preserve their underlying place of articulation, ICC[place] must dominate PRESERVE[dors] and PRESERVE[lab], as in (11b). ICC[place] is only violated when the nasal is coronal, expressed by the high ranking of PRESERVE[cor]. This pattern is illustrated in the tableau in (12a), with a coronal nasal and following labial serving as input. An unfaithful mapping between the input and candidate (ii) yields assimilation, yet since the result violates high-ranking PRESERVE[cor], the candidate loses out to the unassimilated candidate in (i). The pattern of place assimilation involving a labial nasal input is provided in (12b). The candidate most faithful to the input violates high-ranking ICC[place]. As a result, the assimilation candidate in (ii)

[12] We assume that the PRESERVE constraints relevant for the SLPC analysis would also include information that the place feature involved belongs to a nasal consonant in order to correctly express the observation that only nasals undergo assimilation.

emerges as optimal despite the violation of lower-ranking PRESERVE[lab]. A dorsal nasal input receives a similar analysis, as shown in (12c).[13]

(12) *Heteromorphemic clusters*

		PRES[cor]	ICC[pl]	PRES[dors]	PRES[lab]
a.	*No assimilation:* /n+p/				
	☞ i. np		*		
	ii. mp	*!			
b.	*Assimilation:* /m+t/				
	i. mt		*!		
	☞ ii. nt				*
c.	*Assimilation:* /ŋ+t/				
	i. ŋt		*!		
	☞ ii. nt			*	

It will be recalled that tautomorphemic clusters are always homorganic in the language. Since there are no alternations involving such clusters, homorganicity cannot be shown to be the result of the process of place assimilation, as it is for heteromorphemic clusters. Nonetheless, Richness of the Base, a fundamental OT principle, requires that all generalisations about elements that occur in the output must be derived from constraint interaction (see e.g. McCarthy 2002b). However, the constraint ranking assumed thus far incorrectly predicts tautomorphemic clusters to pattern the same way as heteromorphemic ones. In what follows we offer a potential solution to this problem (see de Lacy 2002, McCarthy 2002a for discussion of alternative approaches).

One means of accounting for the distinct patterning of tauto- and heteromorphemic clusters is, we would suggest, to enrich the PRESERVE constraints such that they refer only to features at a morpheme boundary, as stated in the constraint's reformulation in (13).

(13) PRESERVE[F] / _+
A feature immediately preceding a morpheme boundary in the input has a correspondent in the output.

The tableaux in (14) illustrate the realisation of the tautomorphemic cluster [mp]. Note that the correct (homorganic) output is selected regardless of whether the consonants in the input are assumed to have the

[13] For simplicity, we have included only the minimal number of candidates required to make our point. We assume that additional high-ranking constraints, such as positional faithfulness constraints (Beckman 1988), would be needed to rule out candidates such as [nt] in (12a), where the place specification of C_2 rather than C_1 is unfaithful to the input.

same or different place specifications, in keeping with Richness of the Base. We will have more to say concerning the realisation of these clusters below.

(14) *Tautomorphemic clusters*

	/nt/	PRES[cor]/__+	ICC[pl]	PRES[dors]/__+	PRES[lab]/__+
a.	☞ i. nt				
	ii. mt		*!		
b.	/mt/				
	☞ i. nt				
	ii. mt		*!		

First, however, consider the process of optional labial nasal deletion. To account for this pattern, we draw on the family of constraints assumed in Prince & Smolensky (1993), as noted in (8), i.e. *PLACE. Parallel to our treatment of PRESERVE constraints, one constraint is assigned for each place of articulation: *PLACE/lab, *PLACE/cor, *PLACE/dors. We assume that each constraint includes information concerning the following conditioning context (recall that deletion optionally occurs before vowels, /j/ and a pause), although for simplicity this information has been omitted. Through the interaction of PRESERVE and *PLACE constraints, the observation that the labial nasal deletes is accounted for in simple terms: *PLACE/lab ≫ PRESERVE[lab] /__+ forces deletion, as shown in (15a). To account for the observation that labial nasal deletion is optional, we make use of variable constraint ranking (see e.g. Reynolds 1994, Kang 1997); as shown in (15b), the alternate ranking of the two constraints predicts labial preservation. The fact that the coronal and dorsal nasals do not undergo deletion is also easily described: each PRESERVE constraint must be ranked above the corresponding *PLACE constraint, i.e. PRESERVE[cor] /__+ ≫ *PLACE/cor, PRESERVE[dors] /__+ ≫ *PLACE/dors.

(15) *PLACE/lab ~ PRESERVE[lab]/__+

a. *Labial nasal deletion*

/am/	*PL/lab	PRES[lab]/__+
i. am	*!	
☞ ii. ã		*

b. *Labial nasal preservation*

/am/	PRES[lab]/__+	*PL/lab
☞ i. am		*
ii. ã	*!	

Note that all three *PLACE constraints must be ranked below ICC[place] in order to correctly predict the homorganicity of tautomorphemic clusters. This is illustrated in (16) for the tautomorphemic output [nt], where it can be seen in tableau (b) that ranking *PLACE/cor above ICC[place] incorrectly forces an output in which homorganicity is sacrificed in order to avoid the inclusion of the coronal nasal. (For simplicity, only violations of *PLACE/cor by the nasal consonant are included.)

(16) *Tautomorphemic clusters*

a.

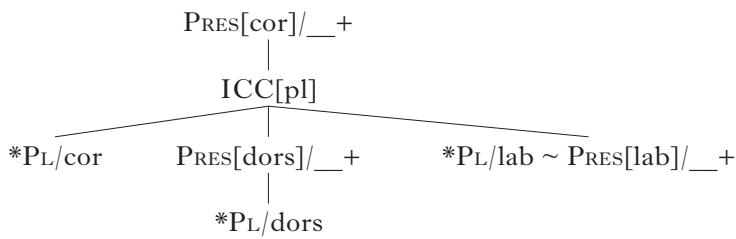
/nt/	ICC[pl]	*PL/cor
☞ i. nt		*
ii. mt	*!	

b.

/nt/	*PL/cor	ICC[pl]
i. nt	*!	
☞ ii. mt		*

For reference, a summary of the constraints and rankings required to account for place assimilation and optional labial nasal deletion are provided in (17). The marked status of coronal is expressed through the ranking of PRESERVE[cor] /__+ above ICC[place], *PLACE/cor and all other PRESERVE constraints. Conversely, the unmarked status of dorsals and labials in place assimilation is expressed through the ranking of the respective PRESERVE constraints below ICC[place]. Finally, labial unmarkedness in nasal deletion is captured through the optional ranking of *PLACE/lab over PRESERVE[lab] /__+. For all other places of articulation, PRESERVE crucially ranks above the relevant *PLACE constraint.

(17)



Finally, as a means of capturing the marked status of dorsal and palatal nasals as compared to the labial and dental-alveolar with respect to distribution, we assume the undominated constraints in (18). The first two effectively rule out dorsal and palatal consonants word-initially, while the third expresses the observation that palatal consonants fail to occur word-finally. We leave open the issue of whether and how frequency information should be represented in the grammar (see e.g. Frisch 1996).

(18) a. *[+nas, dors] / #__
A dorsal nasal consonant is prohibited in word-initial position.
b. *[+nas, cor, −ant] / #__
A palatal nasal consonant is prohibited in word-initial position.
c. *[+nas, cor, −ant] /__#
A palatal nasal consonant is prohibited in word-final position.

The main objective of this section has been to show that the analysis of place asymmetries in SLPC is straightforward given the appropriate ranking of place constraints. Naturally, by assuming that they are freely rankable, strong predictions emerge concerning the range of patterns expected cross-linguistically. As we show just below for place assimilation, the predictions are borne out.

4.2.2 *Predictions of freely rankable place constraints for place assimilation.* With no universally fixed ranking of place constraints, any place of articulation is predicted to be the target of assimilation, as shown in (19). As above, we make use of the interaction of ICC[place] and the PRESERVE[place] constraints to describe assimilation. All patterns are attested.

(19)	*Ranking*	*Predicted target*	*Non-target*
a.	PRES[cor], PRES[lab] ≫ ICC[pl] ≫ PRES[dors]	*dorsal*	*coronal, labial*
b.	PRES[lab], PRES[dors] ≫ ICC[pl] ≫ PRES[cor]	*coronal*	*labial, dorsal*
c.	PRES[cor], PRES[dors] ≫ ICC[pl] ≫ PRES[lab]	*labial*	*coronal, dorsal*
d.	PRES[lab] ≫ ICC[pl] ≫ PRES[cor], PRES[dors]	*coronal, dorsal*	*labial*
e.	PRES[dors] ≫ ICC[pl] ≫ PRES[lab], PRES[cor]	*labial, coronal*	*dorsal*
f.	PRES[cor] ≫ ICC[pl] ≫ PRES[lab], PRES[dors]	*labial, dorsal*	*coronal*
g.	ICC[pl] ≫ PRES[lab], PRES[dors], PRES[cor]	*labial, coronal, dorsal*	—

Informally, the ranking in (a) states that it is more important to preserve the coronal and labial features of a consonant than it is to satisfy the consonant cluster homorganicity constraint; coronals and labials thus fail to undergo assimilation. The feature dorsal, on the other hand, is lost in order to satisfy homorganicity, hence the ranking of ICC[place] above PRESERVE[dors]. This pattern is observed in Chukchi (Kenstowicz 1986, Odden 1987). In the second pattern, coronal is predicted to undergo

assimilation while labial and velar are not, a pattern attested in, for example, German (Kohler 1990) and Yakut (Kenstowicz 1994). In the third pattern, only labial undergoes assimilation, a pattern that Stemberger (1992, based on data from Marlett 1981) reports for Seri.[14] When ICC [place] is ranked above two place constraints we predict situations in which two of the three features undergo assimilation while the third does not. Recall that such patterns are clearly problematic for theories in which only a single feature may be selected as unmarked. In (d), coronal and dorsal consonants are predicted to undergo assimilation while the labial is not, as observed in Marinduque Tagalog (Soberano 1980). The patterns in (e) and (f), in which the velar and coronal fail to undergo assimilation, occur in Korean and SLPC, respectively, as discussed above. The final pattern, in which all places assimilate to a following consonant, is observed in Malayalam (Mohanan 1993).

While it is beyond the scope of this paper to evaluate all proposed cases of fixed constraint ranking, we suggest that the use of this formal device to account for sound patterns involving, at least, place of articulation is superfluous. In fact, a theory with freely rankable place constraints is empirically equivalent to one using fixed rankings supplemented by more highly ranked constraints: both allow all place features to pattern as unmarked. However, the two approaches differ in terms of at least one key heuristic principle: simplicity. While both make use of constraint ranking, a fundamental tenet of Optimality Theory, only the latter theory incorporates fixed ranking as a formal tool. By Occam's Razor, we may conclude that the theory making use of only freely rankable constraints is more highly valued. We view the elimination of fixed constraint rankings in the case of place features as a positive outcome of OT, given that they are antithetical to the basic underpinnings of the theory: constraint conflict. We speculate that upon closer scrutiny other cases of fixed ranking will be revealed to be equally superfluous.

5 Conclusion

While the phonological evidence strongly supports treating labial as unmarked in SLPC (as well as in Seri; Stemberger 1992), it is nonetheless clear that unmarked labials are decidedly uncommon cross-linguistically. Coronal unmarkedness is clearly the more typical case. Why then, we might ask, is coronal not unmarked in SLPC? One type of explanation draws on inventory considerations (see e.g. Avery & Rice 1989 for related discussion). According to this view, coronal cannot be unmarked since the SLPC inventory includes two coronal nasals, a dental-alveolar and a palatal, while there is only one labial nasal and one dorsal nasal. Assuming a specification-based approach, the two coronals would each need to bear coronal features in order to be distinct. Aside from the problems noted

[14] We are grateful to a reviewer for pointing out this pattern to us.

above concerning structure-based approaches to markedness, this type of account would still need to address the issue of how the labial and dorsal are specified. Despite the fact that the dorsal nasal is marginal (except in word-medial position), it must bear some place specification in order to be distinguished from the labial. A second, related explanation concerns the preservation of contrast between sounds (Steriade 1995). In this account, the reason why the coronal nasal does not delete or assimilate is because it must remain distinct from the palatal nasal, perhaps formalised as a constraint on contrast preservation. There is no similar pressure for the labial or dorsal since they do not contrast within their place category. A potential problem for this account concerns the observation that the dental-alveolar nasal does not contrast with the palatal nasal in word-final position, the context for assimilation and deletion; coronal distinctiveness is then not an issue in this environment. If, however, the mere existence of another coronal in the inventory were a sufficient criterion for maintaining distinctiveness, this approach could prove promising. Of course, an independent explanation would still be required to explain why the dorsal nasal does not delete word-finally, even though distinctiveness is irrelevant in this case. Although neither solution seems entirely satisfactory to us at this stage, we offer them as a starting point for further consideration.

As a closing note, we speculate on the relative rarity of labial unmarkedness. In terms of phonetics, it is commonly assumed that marked sounds are more salient than unmarked ones (see e.g. Battistella 1990 for related discussion). Suggestive experimental evidence pointing to the greater salience of labials can be found in Winters (2001), where American English listeners were shown to be significantly more sensitive to labial place than to either coronal or dorsal place in preconsonantal position (cf. Jun 1995). Sensitivity further increased when the labial was a nasal rather than an oral stop. The greater salience of labials over coronals, in particular, may be tied to a difference in the speed of the articulatory gestures. According to Jun (1995: 228), the weakness of an unreleased coronal may relate to the higher velocity of its articulation: 'tongue tip gestures are rapid; thus they have rapid transition cues. In contrast, tongue dorsum and lip gestures are more sluggish; thus, they have long transitions. Consequently, noncoronals have more robust perceptual cues than coronals'. The salience of labials may be further enhanced by an additional visual cue which is lacking in coronals and dorsals, i.e. lip constriction (Winters 2000).

Despite the relative rarity of labial unmarkedness, it is clear from the asymmetrical patterning of place features in Sri Lankan Portuguese Creole that the unmarked place for nasals in the language is labial. This finding is all the more striking given that it is based on the same types of evidence commonly used to determine the unmarked status of other places of articulation. Given that labial, in addition to (at least) dorsal and coronal can pattern as unmarked in language, we conclude that formally restricting the patterning of place features on the basis of markedness considerations is unfounded.

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