

Some real and not-so real consequences of comparative markedness

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In this stimulating paper McCarthy returns to the fundamental conceptual foundations of OT: the output-orientation of markedness effects. The paper has made me think in a new way about several areas of my recent research on the variable behaviour of laterals (Yip 2003), and my ongoing work on tone. The remarks below summarize some of that thinking.

1. Target conditions as a grandfathering effect

McCarthy speculates (p.21-2) that target conditions in rules may be analysable as instances of `NEWMARKEDNESS >> AGREE >> OLDMARKEDNESS`. While I entirely agree that it is appealing to use feature co-occurrence markedness statements to capture target conditions on processes, in many such cases there does not seem to be a conclusive argument for comparative markedness versus undifferentiated ‘perpetual markedness’. In this section I make this point by looking at the target conditions on lateral spreading.

1.2 Lateral spreading

From the work of Blevins (1994), Rice and Avery (1991) we know that Place assimilation sometimes spreads [lateral] and sometimes does not, and that the same is true of processes that spread nasality and voicing off sonorants. The target of spreading may be restricted to coronals, sonorants, or both.

Suppose we capture the fact that the least marked lateral is a coronal sonorant by means of two universally fixed hierarchies of feature-occurrence constraints.

- (1) *LATERALOBSTRUENT >> *LATERALSONORANT
 *LATERALLABIAL >> *LATERALDORSAL >> *LATERALCORONAL

Placing the faithfulness constraints at different points in these hierarchies gives us a typology of segmental inventories like those below:

(2) *Typology of lateral place of articulation*

- | | |
|------------------------------|---|
| *LAT OBS >> *LATSON >> FAITH | Languages with no laterals (18.6%, Maddieson 1984) |
| *LATOBS >> FAITH >> *LATSON | Common language type, with sonorant laterals |
| FAITH >> *LATOBS >> *LATSON | Languages with both obstruent and sonorant laterals |

(3) *Typology of lateral sonorants and obstruents*

- | | |
|---|--|
| *LATLAB >> *LATDORS >> *LATCOR >> FAITH | Either no laterals, or placeless ones. |
| *LATLAB >> *LATDORS >> FAITH >> *LATCOR | Common type, with Coronal laterals only. |
| *LATLAB >> FAITH >> *LATDORS >> *LATCOR | New Guinea type, with velar and coronal laterals, or perhaps palatal laterals. |
| FAITH >> *LATLAB >> *LATDORS >> *LATCOR | Unattested |

Now consider the creation of new laterals by assimilation or perhaps under pressure from the

Syllable Contact Law. Let us assume that assimilation involves a violation of the IDENT family of faithfulness constraints, such as IDENT-PLACE, and IDENT-SON, under pressure from higher ranked constraints such as SHARE-F (or AGREE) and SYLLABLE CONTACT. Any assimilation process that creates the ordinary sonorant Coronal lateral [l] from an underlying non-coronal or non-sonorant will thus violate at least one of IDENT-PLACE and IDENT-SON (and of course also IDENT-LAT). The ranking of these constraints with respect to the constraints causing assimilation, here abbreviated as ASSIM, will determine which segments may undergo the process. If IDENTSON >> ASSIM, targets must be sonorant. If IDENTPLACE >> ASSIM, targets must be Coronal. If the output is always Coronal and sonorant, *LATOBS and *LATDORS are always high ranked, and *LATCOR and *LATSON are always low-ranked. The following typology results:

(4) a. Target must be sonorant:

*LATOBS, IDENT-SON >> ASSIM >> *LATSON

a'. Target need not be sonorant, but output will be:

*LATOBS >> ASSIM >> IDENT-SON, *LATSON

b. Target must be Coronal:

*LATDORS, IDENT-PLACE >> ASSIM >> *LATCOR

b'. Target need not be Coronal, but output will be:

*LATDORS >> ASSIM >> IDENT-PLACE, *LATCOR

By combining one of the sonorancy rankings with one of the Place rankings, we get the following mini-grammars

(5) a & b.: Target must be sonorant and Coronal: Terafene Flemish, Toba Batak

*LATOBS, *LATDORS, **IDENT-PLACE, IDENT-SON** >> ASSIM

a & b': Target must be sonorant, but need not be Coronal: Selayarese

*LATOBS, *LATDORS, **IDENT-SON** >>ASSIM >> **IDENT-PLACE**

a' & b: Target must be Coronal, but need not be sonorant: Sanskrit, Yanggu

*LATOBS, *LATDORS, **IDENT-PLACE** >> ASSIM >> **IDENT-SON**

a' & b': Target need not be Coronal or sonorant, but output will be both: ?

*LATOBS, *LATDORS, **ASSIM** >> **IDENT-SON, IDENT-PLACE**

The first case in (5) is exemplified by Terafene Flemish (Blevins 1994), where Coronal nasals lateralize after /l/, but non-Coronals and non-nasals do not:

(6)	a. smelt-n	smeltl	'to melt'
	vals-n	valsl	'filings'
	b. elp-n	elpen	'to help'
	zwolme	zwoleme	?

The second case is exemplified by Selayarese , discussed in detail in the next section, where the velar nasal lateralizes to Coronal [l], as in /annaŋ loka/ → anna[l]oka, but obstruents are unaffected. The third case is the reverse: in Sanskrit all coronals lateralize , even obstruents, but non-coronals do not; they simply voice (Whitney 1889:54. No glosses given.):

(7)	tat labhate	→ tal labhate
	trin lokan	→ triṅ lokan

In all these cases *LATCOR and *LATSON are low ranked, and this would be true for both OldMarkedness and NewMarkedness versions, since these languages have underlying old laterals, and also allow the creation of new ones from some subset of targets. The more interesting cases are those where underlying laterals survive, but new ones are *not* created. This will arise in any

ranking where *LATSON, *LATCOR (and of course also *LATOBS, *LATDORS) are ranked above ASSIM, blocking laterality from surfacing at all on the target. In such cases we would observe either failure of assimilation altogether before laterals (Javanese), or possibly assimilation of other lateral properties, such as voicing (Polish), or coronality (Chukchi), but not laterality. But if undifferentiated old and new *LATSON and *LATCOR are high ranked, how can underlying laterals survive? Is this where the NewMarkedness/OldMarkedness distinction plays a role? In the next section I show that at least some apparent cases of this type can be analysed without the NewMarkedness/OldMarkedness distinction, and that we must be cautious in claiming such data in support of comparative markedness.

1.2 Grandfathering effects without comparative markedness:

Apparent grandfathering effects are all over the place once one looks for them, but only a sub-set of them fall into the class of cases that motivate the need for NEWMARKEDNESS >> FAITH >> OLDMARKEDNESS. To qualify, it must be the case that exactly one feature is changing in the process in question, and exactly that feature must be preserved in underlying segments. For example, in McCarthy's first example of Mekkan Arabic voicing assimilation the feature that changes is always [voice], but new voiced obstruents cannot be created even though underlying ones survive. Crucially, the assimilation process *can* alter voicing, since it creates new voiceless obstruents.

In contrast, consider Place assimilation. Place assimilation spreads a collection of features, not just one. For assimilation to happen, AGREE >> IDENT, where AGREE is violated once for every feature that is not shared by two adjacent consonants, and IDENT is the family of IDENT constraints covering all features that are changed by the assimilation process. If a single feature F from the 'Place' complex fails to spread when we expect it to, it is apparently the case that *F

>> AGREE >> IDENT. Now suppose underlying instances of F survive, meaning that IDENT-F >> *F. So long as there is no evidence that the family of IDENT constraints dominated by AGREE includes IDENT-F, there is no problem. The only evidence that AGREE dominates IDENT-F will be if assimilation, while not creating new instances of F, *does* destroy some underlying instances of F in the assimilatory context.

Let me now make this more specific. Suppose place assimilation cannot create new laterals, but underlying laterals survive as they do in Chukchi. This will only be a case that supports McCarthy's proposal if place assimilation can be shown to have the power to change laterality by de-lateralizing underlying laterals, and such evidence is usually missing, as it is in Chukchi.

Cases that do not meet these criteria can be analysed with simple undifferentiated 'perpetual markedness', which holds equally of old and new segments. To illustrate this, consider again the contrast between Selayarese and Chukchi place assimilation. In both languages velar nasals assimilate in Place to a following consonant, but before laterals Selayarese creates a new lateral [l], whereas Chukchi simply creates a coronal nasal [n]. Underlying laterals survive in both languages, so Chukchi gives the illusion of a grandfather effect.

The basic facts are given below. In Selayarese, underlying singleton and geminate laterals are found in words like [lo:ka] 'banana', [balli] 'price', [lla:ri] 'run'. New laterals are also created by Place assimilation, despite the fact that in general /l/ seems to be disliked in codas, since an echo vowel is inserted after /l/ at the end of a word:

(8) a. *Selayarese Place assimilation:* (Mithun and Basri 1985)

anna[ŋ] 'six'	anna[mp]oke 'six spears'	anna[ɲj]arang 'six horses'
	anna[nt]au 'six persons'	anna[nr]upa 'six kinds'
	anna[l l]oka 'six bananas'	

In Chukchi, underlying laterals also survive untouched even in assimilation contexts:

- (9) qlaulqai ‘little man’ (Bogoras 1922 :660)
 Intuulpir ‘son-in’law’ (B:644)
 pIlvInt ‘iron, metal’ (B:647) ,

but unlike in Selayarese the creation of new ones during Place assimilation is prohibited:

b. Chuckhi: (Clements & Hume 1995: 270)

təŋ-ətʔ-ən	‘good’ (/tEŋ-/)	tan-tsai	‘good tea’
tam-pera-k	‘to look good’	tan-ran	‘good house’
tam-vairgin	‘good being’	ten-yətqət-ək	‘to sleep well’
tam-waʔəŋ-ən	‘good life’	<i>but</i> ten-leut	‘good head’ *tel-leut

The difference between the grammars of the two languages lies in the relative ranking of *LATSON and AGREE, where AGREE requires adjacent consonants to have identical values for as many features as possible. It will be held in check by markedness constraints such as *LATSON, and faithfulness constraints such as IDENT-VOICE (in a language without voicing assimilation). In Selayarese, AGREE is ranked above *LATSON, and so it can create new lateral sonorants. In Chukchi, AGREE is ranked below *LATSON, so all the other Place features are shared, but not laterality, and the segment remains a nasal. For full details see Yip (2003). I begin with the grammar of Selayarese, in which low-ranked *LATSON leaves both underlying and newly created laterals intact. In the tableau below candidate (a) with total assimilation wins because AGREE can be fully satisfied since it outranks IDENT-PLACE and *LATSON.

(10) Selayarese:

***LATOBS, *LATDORS, IDENT-SON >> AGREE >> IDENT-PLACE, *LATSON, *LATCOR**

/ŋl/	*LATDORS	AGREE	IDENT-PLACE	*LATSON
a. ll			*	**
b. ŋl		**!		*
c. nl		*!	*	*
d. lɭ	*!	*		**

The more interesting case is Chuckhi, for which the equivalent tableau is given below. Here the fully assimilated candidate (c) violates *LATSON twice, and thus candidate (a) with only one lateral is optimal, even though it violates AGREE with respect to both coronality and laterality.

(11) Chukchi:

***LATOBS, *LATDORS, IDENT-SON >> *LATSON >> AGREE >> IDENT-PLACE, *LATCOR**

/ŋ-l/	*LATDORS	*LATSON	AGREE	IDENT-PLACE
a. nl		*	*	*
b. ŋl		*	**!	
c. ll		**!		*
d. lɭ	*!	**	*	

The crucial point is that the ranking of *LATSON >> AGREE >> IDENT-PLACE has no adverse effects on underlying laterals, because the *LATSON constraint does not need to outrank general IDENT-LAT in Chukchi, since laterality is not in fact changed by this process. There is no evidence that AGREE >> IDENT-LAT, only that it dominates IDENT-PLACE. Note that there is no claim being made about feature geometry: IDENT-PLACE is a shorthand for IDENT-LAB, IDENT-COR, IDENT-

DORS, and any other feature that changes.

The conclusion I wish to draw from this discussion is that while comparative markedness may be needed for a sub-set of grandfather effects, we must use caution when constructing arguments for its necessity. In the next section I move to a set of topics related to tonal phonology, beginning with the inverse of the grandfathering phenomenon, where old markedness outranks new markedness.

2. Tonal effects of OldMarkedness/NewMarkedness

I look here at three tonal effects of separating OldMarkedness and NewMarkedness.

2.1 OCP effects: high-ranked old markedness.

The OCP has been shown to be very active as an output constraint in tonal phonology (Myers 1997), and it is clear that both old and new OCP violations are avoided in many languages, whereas others seem to tolerate either old or new violations, or both (see Odden 1986 for examples).

Digo presents an interesting case of the _oOCP dominating the _NOCP, but with some complications. First, some background. Digo (Kisseberth 1984) attracts the last H tone of a verb form to the final foot, as can be seen in the left-hand column below. The underlined vowels are the sources of the H tones. The H tone is realized on the penult before a voiced obstruent, otherwise as a rising falling sequence over the full foot, as seen here. If there are two high tones (as in the second column) the first one attaches to the initial syllable of the morphological constituent known as the macrostem or verbal complex, whose left edge is shown here by a square bracket.

(12) <i>Toneless subject marker</i>	<i>High-toned subject marker</i>
ni-na-[a-gurĩr-â ‘I am buying for them’	a-na-[á-gurír-â ‘He/she is..’ (K:131)
ni-na-[sĩndĩk-â ‘I am shutting the door’	a-na-[sĩndík-â ‘He/she is..’ (K:125)
ni-na-[pupũt-â ‘I am beating’	a-na-[púpút-â ‘He/she is..’ (K:125)

Crucially, the result in the last two examples in the second column is a surface OCP violation, so the constraint that aligns H with the macrostem clearly dominates the OCP. However, if the input itself contains two adjacent high tones, such as arise when a H-toned root is directly preceded by a H-toned object prefix, this prefix has no tonal effects at all - its H tone appears to have been deleted:

(13) ku-pupũt-â ‘to beat’	ku-a-púpút-â ‘to beat you pl/them’ (K:122)
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This is of course something we see frequently in Bantu languages: in a sequence of two adjacent H tones, one deletes by a process dubbed Meeussen’s Rule by Goldsmith 1984, and it is usually seen as an instance of the OCP. The problem is that the OCP seems to care here about the *underlying* adjacency of the tones, even though the standard alignment constraints of the language would in fact allow the H’s to surface on non-adjacent vowels, resulting in the hypothetical but non-existent *[ku-á-pupũt-â], which contains no surface OCP violation at all.

An account of these facts needs two things. First, we must distinguish between OldMarkedness and NewMarkedness. Secondly, and rather worryingly, we must have some way of recording the source of a tone. I shall use subscripts that number syllables left-to-right, and give tones the same number as their originating syllable. This means that a sequence $H_n H_{n+1}$ is an old OCP violation, no matter where the tones are associated in the output. On the other hand a $H_n H_{n+2}$

sequence is not an old OCP violation, but if the tones are adjacent in the output it will be a new OCP violation. With this in hand, the facts follow if ${}_o\text{OCP} \gg \text{MAX-T, ALIGN-MACROSTEM} \gg {}_N\text{OCP}$. Old markedness violations will be able to compel tone deletion, and block alignment with the macrostem, but new markedness violations are allowed. Before leaving Digo, two caveats. Firstly, this account does not explain why the high-toned tense marker ka does not lose its H next to another H. Secondly, it may be that the two surviving H's in (12) have in fact fused into one: Myers (p.c.) points out that there is no downstep between the two surface highs in *a-na-púpút-â*, as one might have expected if they were indeed two separate H tones. In that case the problem changes to one of why only underlyingly non-adjacent H's are allowed to fuse rather than delete.

2.2 Local spreading: not reducible to high-ranked old markedness:

The second tonal matter that deserves comment is the interesting proposal (p.39) that non-iterative local spreading is the result of ${}_o\text{AGREE} \gg \text{FAITH} \gg {}_N\text{AGREE}$. Nina Topintzi (p.c.) has pointed out that this proposal only works for lexically linked tones. If the tone is simply the property of some morpheme, with no evidence for any lexical linking to a particular vowel, the account fails. This is because all associations are new, so every AGREE violation is an equal violation of ${}_N\text{AGREE}$. One possible solution to this is to assume that the underlyingly tones of some segmental morpheme are always linked to some TBU of that morpheme whenever their position is predictable, as a result of Lexicon Optimization (as Myers 1997:856, fn6 assumes). This will not however work in languages where a morpheme consists solely of tone, as is the case with the H that one finds in non-assertive verbs of the N. Karanga dialect of Shona (Hewitt and Prince 1989), shown on the right below:

(14) *L-Toned Roots*

a. Assertive

b. Non-assertive

L

H

L L

L H

L L L

L H L

L L L L

L H H L

L L L L L

L H H L L

L L L L L L

L H H L L L

L L L L L L L

L H H L L L L

ku-bik-is-ir-a ‘to make cook for’

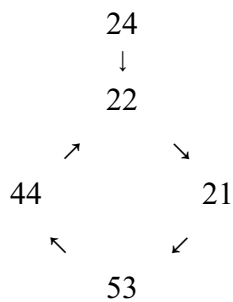
handáká-bik-ís-ír-a ‘I didn’t make cook for’

These data show that even an underlying floating H tone affix may be the source of local spreading exactly one syllable to the right. I conclude that some sort of locality statement cannot be dispensed with.

2.3 Chainshifts

The proposal that chainshifts might also succumb to the comparative markedness approach is tempting for anyone interested in Asian tone, because of the famous Min tone circle case, in which the tones found when a morpheme is in final position (i.e. their citation tones) change when non-final as shown by the arrows in the diagram below (Chen 2000, Yip 2002:120):

(15) *Taiwanese Min tone circle*



I worry, however, that this is pushing the power of OT too far. If every feature F has a *F constraint, every feature loss reduces markedness. So $e \rightarrow i$ and $i \rightarrow e$ both reduce markedness in different ways. In general terms, this misses the observation that, at least for tonal chainshifts, there is an overall reduction in the markedness of the tonal inventory in the less prominent environment (Yip 2002: 189). The same problem arises even if one sticks to McCarthy's example of vowel height. For example, it opens up the possibility that there could be languages in which vowels exchange height values in unstressed position, so that unstressed /i/ becomes [e] and unstressed /e/ becomes [i], a situation that arises if the grammar in McCarthy's tableau (47) on p.48 has at the top of the ranking HEAD-IDENT (high). I know of no such system.

3. Conclusion

McCarthy's paper offers an innovative approach to a collection of problems for output-based theories, and makes apparent previously unrecognized links between phenomena such as grandfathering and derived environment effects. The concern, of course, is that this extra power may over-generate impossible grammars, as in the chainshifting of unstressed vowels.

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