Myopic harmony and nonlocal trigger-target asymmetyries

1. Introduction

Current phonological theory resorts to a large set of different, usually competing mechanisms to derive vowel harmony (Search and Copy, Spreading, in derivational frameworks; Align, Agree, Share, and Agreement by Correspondence in OT, among others; see Gafos and Dye 2011, Walker 2012). At the same time, there is not a clear divide of the empirical domain (vowel harmony proper, metaphony, nasal harmony, consonantal harmony, etc.). While watiting for some desirable unification, it seems crucial to get a picture that is as clear as possible of which phenomena are members of the same natural class, and which are the mechanisms that should account for each class of phenomena (Archangeli and Pulleyblank 2007, Gafos and Dye 2011). In important recent work Walker (2005, 2010, 2011, 2014) has examined a vast array of cases of vowel harmony and has proposed a family of Generalized Prominence-based Licensing constraints that account for certain cases of harmonic spreading. In this reply I will examine some of her claims, especially those in two articles published in this journal, Walker (2014) and Walker (2010), that relate to myopia and trigger-target asymmetries. Both papers use the general framework developed and exemplified in detail in Walker (2005, 2011).

In Walker (2014) two cases are presented showing trigger-target asymmetries that are problematic for local iterative rules or local agreement constraints. The central argument of the paper is the following. Unbounded harmonic processes obey myopia, "no look ahead" (Wilson 2003, 2006), i.e. the generalization that in $X_1...X_2...X_3$ or in $X_3...X_2...X_1$ spreading from X_1 to X_2 is independent of whether spreading can proceed to X_3. This constitutes a problem for OT constraints like AGREE, which require agreement

of some properties of adjacent pairs of segments. In a case of progressive rounding like *bolbəxi-wə* → *bolboxi-wə* in Bainiyya Orochen ((10), below), where the vowel *i* is a blocker, the candidates *bolbəxi-wə*, *bolboxi-wə* both tie w.r.t. AGREE because both contain just one pair (*o ə* and *o i*, respectively) that does not agree in [round], and the more faithful **bolbəxi-wə* will be selected. Proposals like Wilson (2006) or McCarthy (2004, 2009) try to avoid this pathologic effect. Walker (2014) resorts to a different mechanism, the family of Generalized Prominence-based Licensing constraints proposed in Walker (2005, 2011) which is capable of deriving myopic effects. In the cases examined in Walker (2014), the basic form of the constraint is as in (1).

(1) ∀-HARMONY(F/C, V): For every feature F in context C in a word, a violation is assigned to every vowel to which F is not associated.

Thus in a case like progressive spreading in $X_1...X_2...X_3$ a feature F associated to X_1 in context C (e.g. word-initial position) must be realized on X_2 and X_3 independently; $bo_1lbo_2xi\text{-}wə$ incurs two violations (o_1 disagrees in [round] with *i* and *ə*), but * $bo_1lbə_1xi\text{-}wə_2$ will incur three violations (o_1 disagrees in [round] with $ə_1$, *i*, and $ə_2$). Therefore no non-myopic effects are derived. In other words, "Since each vowel that fails to harmonize with a trigger forms a locus of violation of ∀-HARMONY, unbounded harmony is expected to propagate until it is impeded by a blocker or reaches the boundary of its domain. In this regard, it is correctly predicted to be myopic." More importanly, the family of Generalized Prominence-based Licensing constraints, because it establishes independent relations between a trigger and a set of targets, predicts nonlocal effects, in particular the kind of nonlocal trigger-target relations that are found in the two harmony systems analyzed, Baiyinna Orochen and Mọbà Yorùbá.

In a previous paper, Walker (2010), the opposite claim is made: it is argued that there are cases of nonmyopic harmony and that the framework developed in Walker (2005) can predicted these cases. Thus in Walker (2010) nonmyopia is predicted and in Walker (2014) nonmyopia is excluded, and both are derived from the very similar frameworks in Walker (2005) and (2011). To clarify this situation, in section 2 I will revise the evidence presented in Walker (2010) in favor of nonmyopia and I will conclude that there is no empirical support for nonmyopic harmony, and that, moreover, the framework developed in Walker (2005, 2011) incorrectly predicts such nonmyopic effects. In section 3 and 4 I will discuss the other claim, the allegedly nonlocal trigger-target relations in Baiyinna Orochen and Mọbà Yorùbá; I will conclude that they do not have the nonlocal properties they are supposed to display, and I will examine the consequences for the analysis of harmony.

2. Is harmony myopic?

Walker (2010) (henceforth NMH) claims that harmony can be nonmyopic: there are cases of bounded harmony in which "adjacent segments undergo assimilation only when a nonlocal viable target is present for a bounded harmony process." (NMH:169) The paper examines metaphony in two Romance dialects in Italy, Grado and Central Veneto, in order to "demonstrate that metaphony is nonmyopic in these systems", and discusses the consequences for phonological theory, in particular the fact that such cases cannot be handled by serial OT with candidate chains (OT-CC). In his reply to NMH, Kimper (2012) shows that, contrary to NMH's claims, under a proper analysis the data can be accounted for in serial OT, but he doesn't challenge the nonmyopic character of the empirical base.

These two dialects, according to NMH, show a harmonic process with the following properties. In paroxytones a post-tonic high *i* triggers raising of a preceding mid close vowel (e, o) in a syllable that receives main stress (2a-b), but low or mid open vowels (a, ɛ, ɔ) are not affected (1c-d); data from NMH, except for (2 c-d) which are from Walker (2005:928).

(2)	a.	kals-ét-o	kals-ít-i	'sock-M SG/PL'	*Central Veneto*
		móv-o	múv-i	'move- PRES.IND.1SG/2SG'	
	b.	rómp-o	rúmp-i	'break-PRES.IND.1SG/2SG'	*Grado*
		albor-ét-o	albor-ít-i	'tree-DIM.M.SG/PL'	
	c.	gát-o	gát-i	'cat-M.SG/PL'	*Central Veneto*
	d.	bɛ́l-o	bɛ́l-i	'beautiful-M.SG/PL'	*Grado*

When the stress is antepenultimate, and the tonic and the internal post-tonic are mid close, both raise:

(3)	a.	órden-o	úrdin-i	'order- PRES.IND.1SG/2SG'	*Central Veneto*
	b.	énzen-e	ínzin-i	'shin-M.SG/PL'	*Grado*
		zóven-e	zúvin-i	'young man-SG/PL'	

The crucial examples are the proparoxytones in (4) [=NMH (3)]. When the stressed vowel is a non-undergoer, i.e. /a/, /ɛ/, /ɔ/, and the internal post-tonic is a potential undergoer, we get a "sour grapes" effect: since the low and mid-open stressed vowels /a/, /ɛ/, /ɔ/ do not raise and hence harmony cannot proceed to its target, the stressed vowel, it is arrested altogether, and the internal post-tonic /e/ or /o/ does not raise:

(4) [=NMH (3)]

a. *Central Veneto*

pɛ́rseg-o	pɛ́rseg-i	*pɛ́rsig-i	'peach-M.SG/PL'
ázen-o	ázen-i	*ázin-i	'donkey-M.SG/PL'
ángol-o	ángol-i	*ángul-i	'angle-M. SG/PL'

b. *Grado*

	bodʒánteni	*bodʒántini	'crab right before it becomes without a shell-M.PL'

These nonmyopic effects are derived from the constraint LICENSE([+high]$_{posttonic}$, σ́) that requires that the [high] features in the final [i] be realized in the stressed position, and the constraint LOCALITY that dominates it and restricts assimilation to adjacent syllables, prohibiting the [+high][–high][+high] configuration in *úrdeni*. Both constraints are dominated by IDENT$_{IO}$(ATR). (5) reproduces the tableau (7) in NMH:

(5) [=NMH (7)]

Input	Output	ID(ATR)	LOC	LIC([+high])	Id(high)
a. /orden-i/	☞ úrdini				**
	órdeni			*!	
	úrdeni		*!		*
b. /pɛrseg-i/	☞ pɛ́rsegi			*	
	pírsigi	*!			**
	pɛ́rsigi			*	*!

But this analysis faces an empirical problem that has important theoretical consequences. In the case of Central Veneto, the data come from Brunelli (2000) (no

relevant proparoxytones are found in the other sources, Rizzi 1989, Belloni 1991, Maiden 1991, Marcato and Ursini 1998; the single example in Zamboni 1974:44, *búgoli*, 'snail-PL' is irrelevant because the stressed target is not an opaque segment).[1] But Brunelli (2000) is a unified dictionary of all Venetan varieties that includes, in addition to Central Veneto, among others, Grado, Venice, Treviso, and Belluno, and it usually doesn't specify dialectal source in the entries. This alone makes the generalization doubtful. But there is a more serious problem. It is true that in Brunelli (2000), and also in his grammar (Brunelli 2012), we don't see raising of the internal post-tonic when the tonic is *a*, *ɛ* or *ɔ*, but this is because there is no raising whatsoever in proparoxytones, i.e. there is no raising either when the tonic is /e/, /o/, /u/, or /i/, a situation that is not uncommon in the metaphonic systems of Italy. If there is no raising in proparoxytones, then the lack of raising in cases like *pɛ́rseg-o* → *pɛ́rseg-i* is not due to myopic harmony, i.e. to the fact that *ɛ, a, ɔ* are non-undergoers, but to the general inability of harmony to take place in proparoxytones. Here are some examples of proparoxytones with unraised mid closed tonic and post-tonic, from Brunelli (2000, 2012). In the examples in (6) and (7) *é, e* and *ó, o* mark mid close vowels.[2]

(6)	bónbolo	bónboli	'fatty-MASC.SG/MASC.PL'
	liévore	liévori	'hare-MASC.SG/MASC.PL'
	zóvene	zóveni	'young-FEM.PL/MASC.PL'
	zóveno	zóveni	'(male) youngster-MASC.SG/MASC.PL'
	artìcolo	artìcoli	'article-MASC.SG/MASC.PL'
	capìtolo	capìtoli	'chapter-MASC.SG/MASC.PL'

The case of Grado is different. Raising in proparoxytones in which both the tonic and the internal post-tonic are mid vowels is regular. In addition to the examples in NMH (3b), here are some more taken from Bottin (2003) and Rosamani (1990):

(7)	géndene	gíndini	'louse's egg-M.SG/M.PL'
	véncolo	vínculi	'feeling of suffocation-M.SG/M.PL'
	tórgolo	túrguli	'turbid-M.SG/M.PL'
	córe	cúrili	'run-2IMP/run-2IMP-to-him'
	tórtolo	túrtuli	'press-M.SG/M.PL'
	zóvene	zúvini	'youngster-M.SG/M.PL'

For proparoxytones with an opaque tonic, i.e. [á], [ɛ́], or [ɔ́], which are crucial for (non-) myopic effects, NMH presents a single example which shows myopic nonraising, *bodʒánteni* (4b), taken from Cortelazzo (1978). But in this source, even if a great majortiy of informants give *bodʒánteni* and similar forms with unraised *e*, several informants give *bodʒántini* and similar forms with raising, and we also find other examples with raising, like *b[ɔ́]culi* 'curls', *gar[ɔ́]fuli* 'carnations' (pp. 89, 140). Moreover, there are informants in the sample that do not show raising even in the regular paroxytone cases, e.g. *fjóri* 'flower-PL', instead of *fjúri*, *dʒenódʒi* 'knee-PL' instead of *dʒenúdʒi*. This indicates that the broad survey (more than 100 informants) of Cortelazzo describes a mixed situation in which different speakers have different systems, younger ones in the process of losing metaphony.[3] When the sources that correspond to an earlier, more stable stage are checked (Marin 1951, 1964, 1981, Bottin 2003)[4], it turns out that only very few proparoxytones show the behavior of the single

example (4b);[5] in most cases the internal post-tonic is also raised. The following examples are from Rosamani (1990), Bottin (2003) and Marin (1951, 1964, 1981):[6]

(8)	mámolo	mámuli	'marble-M.SG/M.PL'
	álboro	álburi	'tree-M.SG/M.PL'
	tɔ́lteno	tɔ́ltini	'squid-M.SG/M.PL'
	trabácolo	trabáculi	'kind of sailboat-M.SG/M.PL'
	vɛ́ncolo	vɛ́nculi	'tie-M.SG/M.PL'
	árzene	árzini	'(water) bank-M.SG/M.PL'
	bɔ́colo	bɔ́culi	'curl-M.SG/M.PL'
	rɛ́folo	rɛ́fuli	'wind blow-M.SG/M.PL'
	ánzolo	ánzuli	'angel-M.SG/M.PL'
	lásselo	lássili	'leave-him/them'

The picture we get after checking these two varieties closely is that in Central Veneto both potential "myopic" and "nonmyopic" proparoxytones do not show metaphonic raising, and that in Grado raising in proparoxytones is indeed myopic. Therefore the conclusion that "Whether harmony occurs locally is therefore determined by long-distance information, producing a nonmyopic pattern" is clearly unjustified. NMH is wrong and Walker (2014) is right: as far as we can presently tell, harmony is indeed myopic. Let us now turn to the theoretical consequences of myopia.

This myopic character poses an overgeneration problem for the family of licensing constraints proposed by Walker (2005, 2011), because it can derive unwanted nonmyopic effects. The licensing constraints have the format ∀(F/C, P);[7] a feature F in context C is licensed in position P by being linked to C and to the positions defined by P

or by there being coindexed, identical instances of F linked to C and to the positions defined by P. This grants them a myopic character when P is instantiated by several elements, since every instance of P that does not satisfy the constraint generates a violation mark. But even if the constraint in itself is myopic, the system of constraints developed in Walker (2011) derives nonmyopic effects. This is clearly shown in NMH, where two nonmyopic harmoy systems (intended for Grado and Central Veneto) are predicted, as shown above in (5). Here the instantiation of the ∀-HARMONY constraint, LIC([+high]$_{posttonic}$, σ́) has a single P position, the stressed syllable, and is satisfied if and only if the [+high] of the final vowels is associated with the stressed vowel, as in *úrdini* and *úrdeni* in (5a). LOCALITY (or its equivalent *DUPLICATE(F) in Walker 2011:54-57) discards *úrdeni* because it has a discontinuous harmonic span. For *pɛ́rsegi*, since LIC([+high]posttonic, σ́) cannot force raising of *ɛ* because it is dominated by IDENT(ATR), LOCALITY will not penalize the faithful candidate and nonmyopic effects are derived. It is thus true that one of the constraints in the Generalized Prominence-based Licensing family "is correctly predicted to be myopic", but in combination with other constraints that are necessary for the system to work, nonmyopic effects are predicted, precisely the situation that should be avoided.

3. Baiyinna Orochen

We can now examine the main claims in Walker (2014) (henceforth, NTTR) regarding trigger-target asymmetries, based on the properties of harmony in Baiyinna Orochen and in Mọbà Yorùbá. I discuss Baiyinna Orochen in this section, and will turn to Mọbà Yorùbá in section 4.

The Baiyinna Orochen vowel system (9) is divided in two sets, non-RTR vowels (i, u, ie, o, ə) and RTR vowels (ɪ, ʊ, ɪɛ, ɔ, a). All contrast also in length, except for the mid front diphtongs (ie, ɪɛ):

(9)

i	iː			u	uː
ɪ	ɪː			ʊ	ʊː
ie				o	oː
ɪɛ		ə	əː	ɔ	ɔː
		a	aː		

The language has RTR harmony, that does not concern us here, and rounding harmony (RH). According to the description in NTTR, based on Li (1996), RH proceeds from left to right and is triggered by a back round vowel with the important exception of the syllable-initial long ones, i.e. *oː* and *ɔː*. It affects the low vowels *a*, *ə* (short or long). The high vowels (short or long) are not affected by RH and block the process. RH applies to the root and across suffixes within the word. In (10) I illustrate all these cases with examples with suffixation.

(10) a. *Short* o, ɔ *trigger RH on nonhigh vowels*

somsok-jo 'pasture-INDEF.ACC' cf. urə-jəː 'mountain-INDEF.ACC.'

bɔdɔ-xɔl 'think-IMMED.IMP.2SG' cf. taŋ-kal 'count- IMMED.IMP.2SG'

b. *Word-initial long oo, ɔɔ do not trigger RH*

boːl-jə 'slave-INDEF.ACC' '

gɔːl-ja 'policy-INDEF.ACC'

c. *Non-initial long* oː, ɔː *transmit RH to the right*

sokkoː-mɲo 'muddy (water)-CONTEMPTIVE'

ɔmɔːŋ-mɔ 'fatty meat (of deer or roe deer)-DEF.ACC'

ɲoɲo-xoːn-mo 'bear-DIM.DEF.ACC' cf. luxi-xəːn-mə 'arrow-DIM.DEF.ACC'

dʒɔlɔ-xɔːn-mɔ 'stone-DIM.DEF.ACC' cf. bɪra-xaːn-ma 'river-DIM.DEF.ACC'

d. *High vowels do not trigger or undergo RH, and are opaque*

owon-duləː 'pancake-DESTIN'

ɔrɔn-dʊlaː 'reindeer-DESTIN'

bolboxi-wə 'wild duck-DEF.ACC'

tʃɔlɪk-pa 'cloud-shaped design-DEF.ACC'

The interpretation in NTTR is that "short [o] and [ɔ] in the initial syllable trigger round harmony in following sequences of nonhigh vowels, both long and short. However, [oː] and [ɔː] in the initial syllable do not trigger round harmony, although in noninitial syllables they propagate it, revealing that initial [o] and [ɔ] can trigger harmony in adjacent and *nonadjacent* targets." (my emphasis) In other words, if agreement is done locally, by a rule or a constraint requiring [round] in a sequence of two syllable-adjacent vowels, like in *ɔmɔːŋ-mɔ* and *boːl-jə* ((10) above), it will correctly trigger harmony in the first case (11a); but then it will also trigger it in the second case (11b). Of course if we limit agreement to sequences in which the first vowel is short, it will correctly derive (11b) but it will underapply in (11a), because in the sequence *ɔːŋ-ma* the first vowel is long.[8]

(11) a. ɔː ɔ ɔm**a**ːŋ-m**a** → ɔm**ɔ**ːŋ-m**ɔ** *ɔm**a**ːŋ-m**a**

b. oː ə b**o**ːl-j**ə** → b**o**ːl-j**ə** *b**o**ːl-j**o**

A Generalized Prominence-based Licensing constraint is proposed that triggers nonlocal agreement. It requires agreement of the trigger with any target within the harmonic domain (NTTR:15):

(12) ∀-HARMONY ([round]/V_{μ}[–high], V), For any [round] feature associated with a short nonhigh vowel, a violation is assigned to every vowel that is not associated with that token of [round] [V_{μ} denotates a short vowel; [round] is privative]

In this analysis, the first vowel in /ɔmaːŋ-ma/ (11a) satisfies the first argument of the ∀-HARMONY constraint in (12) (it is round, short and nonhigh); hence the [round] feature must be associated with the second vowel, and (nonlocally) with the final vowel; in other words, the final vowel does not get [round] from the adjacent long vowel, but directly from the initial short vowel. In (11b) the first vowel in /boːl-jə/ is long and does not satisft the [round]/V_{μ}[–high] condition of ∀-HARMONY, hence there is no harmonic propagation. When there is a blocker separating the trigger from a potential target, as in /bolbəxi̱-wə/ → bolboxi̱-wə (10d), two outcomes have to be excluded, namely *bolboxi̱-wo* with harmony across the blocker, and *bolboxu̱-wə* with a harmonized blocker. The first one can arise because trigger-target interaction is nonlocal and it could cause long-distance agreement across a blocker. It is prevented by NOGAP, a constraint "which prevents feature associations that gap across prosodic anchors or segments", and which could be either a constraint on the structures generated by GEN, or a constraint included in CON. The second possible output, *bolboxu̱-wə*, is excluded by the constraint GESTURALUNIFORMITY:

(13) [=NTTR (25)] GESTURALUNIFORMITY([round], [high]): Assign a violation to each sequence of adjacent vowels to which a token of the feature [round] is associated, where the vowels differ in specification for [high].

GESTURALUNIFORMITY raises a problem. Since it dominates ∀-HARMONY (NTTR:18), and ∀-HARMONY dominates IDENT-O→I (round) (NTTR:23bii), then GESTURALUNIFORMITY must dominate IDENT-O→I (round). This correctly disallows the rounding of nonhigh vowels across high vowels, as in *bolboxi̱-wə* → **bolboxi̱-wo*, but it also disallows underlying sequences including a mid round trigger/target and a high round blocker which are not both [+high], like sequences containing *o,u* or *ɔ,ʊ*, as in the following examples (Li 1996:130): *boːsu* 'cloth', *ɔrɔ̱n-dʊ̱laː* 'reindeer-DESTIN', *owo̱n-du̱ləː* pancake-DESTIN' (Li 1996:132). Consider tableau (26) in NTTR reproduced below as (14a) and and the result of applying the same constraint ordering to the input of *owən-duləː* in (14b) (I omit association lines information in the original):[9]

(14) a. [=NTTR (26)]

/bolbəxi-wə /	GESTUNI (round, high)	∀-HARMONY ([round]/Vμ[–hi], V)	*[round, –high]	IDENT-O→I (round)
☞ a. bolboxi-wə		**	**	*
b. bolbəxi-wə		***!	*	
c. bolboxu-wo	*!*		***	***

b.

/owən-dulə:/	GESTUNI (round, high)	∀-HARMONY ([round]/Vμ[–hi], V)	*[round, –high]	IDENT-O→I (round)
☞ *owən-dulə:	*!	*	*	
owon-dulə:		**	**	*
owon-dulo:	*!*		***	**

The blocking by both high vowels (and front diphtongs, as we will see) cannot be derived by a more specific formulation of ∀-HARMONY (12), e.g. "For any [round] feature associated with a short nonhigh vowel, a violation is assigned to every *nonhigh* vowel that is not associated with that token of [round]"; because of its nonlocal properties, the revised ∀-HARMONY will still prefer *bolboxu-wo* to *bolboxi-wə* in (15a), and dominating GESTURALUNIFORMITY (round, high) will still be necessary.

We can now return to the main claim, the trigger-target asymmetry (o, ɔ *vs*. o:, ɔ:) that lies at the heart of the analysis. This asymmetry rests upon the fact that long vowels are propagating undergoers but do not trigger RH.[10] Let us examine this claim in more detail.

NTTR does not mention an important fact, namely that the mid front vowels *ie* and *ɪɛ* behave exactly as high vowels, not undergoing harmony and blocking it, as Li (1996:132) reports: "Vowels other than low back [= short and long o, ə, ɔ, a, JM] are opaque and block the process.". So to the examples given in NTRR (10) [=(10d) above] we should add those reported by Li (1996:128, 132, 133, 137), that show that mid front diphtongs do not undergo (15a) and block (15b) RH:

(15)	a.	kɔŋnɔ-bɪɛn	'black'		
		ɔrɔ-tʃɪɛn	'Oro people, Orochen'		
	b.	bomboŋkie-wə	'Shaman's hat-DEF.ACC'	cf. kinɔ-wɔ	'film-DEF.ACC'
		ɔmɔlɪɛ-xal	'grandson-PL'	cf. mɔŋkɔ-xɔl-ɪw	'my boat-PL'

Once this fact is taken into consideration, a different picture emerges. It is clear that *ie*, *ɪɛ* are grouped together with high vowels in the class of blockers because they all contain a [+high] element: *i, u* and their long and RTR counterparts are [+high] and *ie*, *ɪɛ* contain an j-glide which is [+high].

At this point some facts of phonetic detail become relevant. Li (1996) uses a notation which just distinguishes the main phonologically relevant properties of the vowel system, namely length, RTR, height (high/mid/low), backness, and rounding. But he gives quite detailed relevant phonetic characterizations in section 4.2.2. The precise distribution of the vowels in the vowel space is not relevant here, but other details are. In his semiphonemic notation, the front diphtongs are /ie/ and /ɪɛ/, but in the phonetic description they are transcribed as [ʲe], [ʲɛ]. The high on-glide in these diphtongs is active, since both diphtongs palatalize a preceding consonant, whereas [ɪː] does not. Another fact that will become important is that in initial position /ie/ and /ɪɛ/ are realized as [je] and [jɛ], respectively.

Let us now turn to the phonetic properties of long mid round *o, ɔ*, the vowels which alledgedly are triggers if short, and nontriggers but transmitters if they are long. Whereas for short *o*, *ɔ* Li (1996:90-91) gives just height and rounding details, in the case of long *oː*, *ɔː* he specifies that "In initial position, /oo/ [=oː, JM] sounds like a diphtong, [uo]." and that "In initial position, /ɔɔ/ [=ɔː, JM] sounds like a diphtong, [ʊɔ], parallel to its Set 1 counterpart /oo/ in the same position." Since high vowels are

blockers, and mid front diphtongs with an on-glide high element ([ʲe], [ʲɛ]) are blockers, it becomes immediately clear why the mid long round vowels /oː/, /ɔː/ are undergoers and spreaders in non-initial position, where they are phonetically [oː], [ɔː], but are not triggers in initial position, where they are phonetically [wo], [ʊɔ̯]. This allows for a natural classification of triggers-undergoers and blockers-nonundergoers in Bainiya Orochen. Segments containing a [+high] element (high vowels, front diphtongs, and long mid back vowels in initial position) are blockers and non-triggers, segments containing no [+high] element (low vowels, mid back short vowels, and mid back long vowels non-initial position) are triggers and undergoers. Any local constraint forcing round vowels which are not associated to a [+high] feature to agree with adjacent following vowels not associated to [+high] will account for the harmonic spreading, and the trigger-target asymmetry disappears.

4. Nasal harmony in Mọbà Yorùbá

The second case of trigger-target asymmetry discussed in NTTR is regressive nasal harmony in the Mọbà dialect of Yorùbá (Ajíbóyè 2001, Ajíbóyè and Pulleyblank 2008). As described in NTTR, Mọbà exhibits regressive harmony triggered by the nasal vowels /ĩ, ã, ũ/ which nasalizes high vowels and sonorants; obstruents are transparent and nonhigh vowels do not undergo harmony and block it:

(16) a. ĩw̃ĩ 'spirit'

ũ̀-r̃ ĩ́ 'walk (N)'

b. ĩ̀tã̀ 'story'

	ìsũ̀gbĩ̀	'traditional singers'
c.	ìrègṹ	'reproaching'
	ùrɔ̃̀rũ̀	'peace of mind'
	ìsasũ̀	'kind of pot'

The examples in (16) are taken from NTTR, (28)-(30). They show nasal spreading across high vowels, glides, and sonorants (16a), transparency of obstruents (16b), and blocking of spreading by nonhigh vowels (16c). The crucial data involve nasal consonants. Only /m/ is phonemic; phonetic [n] is the result of nasalization of /l/. The consonant /m/ does not trigger harmony and it is transparent: when preceding a nasal vowel it allows nasal spreading from the vowel to proceed leftwards, as shown in (17).

(17) a. [=NTTR (31)]

ùmoɟì	name of a village	ìmɛ́lɛ́	'laziness'
ùmórù	personal name		
ĩmṹ	'nose'	ũ̃mã̌lɛ	'light'
ĩmã̌	'palm leaf'	ũ̃mũ̌ra	'preparedness'
ũ̃mũmĩ̀	'drinking cup'	ũ̃mã̌sí	'having knowledge of an act'
b. ùsàmĩ̀	'baptism'		

NTTR does not propose a specific constraint-based analysis, but concludes that this is a case of trigger-target asymmetry like Baiyinna Orochen (p. 23): "If nasal consonants are participants in harmony but do not trigger it, then the examples in (31b) [=(17b)] involve nonlocal trigger-target relations between a nasal vowel and a high vowel in the preceding syllable in the presence of local transmission of nasalization." But this

conclusion does not follow because the first conjunct in the if-clause is unwarranted. The fact that "nasal consonants are participants in harmony but do not trigger it" is based on the assumption that nasal harmony is a single process in which nasality can spread from a vowel to a preceding glide or sonorant, and and proceed leftwards to a preceding vowel. But Ajíbóyè and Pulleyblank (2008) argue in detail and convincingly for a separation of nasal harmony in different processes, the ones relevant here being "syllable-internal agreement" and "word-level harmony." They derive Syllable internal agreement from the constraints $*[ON]_{\sigma}$ and $*[NO]_{\sigma}$ that prohibit intrasyllabic adjacent [+sont] segments one of which is oral (O) and the other nasal (N); the process is syllable-internal, and it is bidirectional. It disallows, for instance, the sequences *rũ, yã, r̃u, ỹa. In rũ, yã* and forces /rũ/ → [r̃ũ], /ru/ → [ru], etc. Contrary to Word level harmony, Syllable internal agreement can apply across word boundaries fed by vowel deletion: the careful pronunciation the two-word sequence *wá. ũ̀.gbí̀* 'look for snail' becomes in connected pronunciation *w̃ũ.gbí̀,* resyllabification across word boundary allowing for Syllable internal agreement. Word-level harmony is an independent regressive harmony process triggered by a nasal vowel (ã, ĩ, ũ); spreading takes place across any consonant, affects only high vowels and is stopped by mid or low vowels; it does not apply across word boundaries. Ajíbóyè and Pulleyblank (2008) propose the following constraint for Word-level harmony (notice that transparent segments are defined as consonants, not as obstruents):

(18) [=(44)] Nasal harmony

Oral/μ C_0 Nasal/μ$]_{Wd}$: an oral mora (i.e. vowel) incurs a violation if preceding a nasal mora (i.e. vowel) with or without intervening consonants; domain = word

Syllable internal agreement is clearly local, occurring only under strict adjacency. Word level harmony is nonlocal only in that there is, as in many harmonic processes, a class of transparent segments which does not intersect with the class of triggers, targets and opaque blockers. The alledged fact that *m* is a transmitter derives from the artifact of collapsing two different processes in one: in the mapping /ùmumĩ/ → [ũ̃mũmĩ], nasality doses not spread (vacuously) from the final *ĩ* to *m*, then from *m* to *u*, etc.: the final vowel spreads nasality to other vowels across the nasal consonants. The nasal *m* in /ùmumĩ/ → [ũ̃mũmĩ] has the same status as *s* and *gb* in /ìsùgbì/ → [ì̃sũgbì] (16b). Because of the static syllable internal regularity, *m* has to agree in nasality with an adjacent vowel, as in ùsàmĩ (17b); in Word level harmony it is inert: it does not spread, as in *ùmoɟì* (17a), and as any other consonant, it does not stop spreading. Hence there is no need for a constraint enforcing nonlocal trigger-target relations.

Summary and conclusion

I have first shown that, given current evidence, vowel harmony is indeed myopic, since upon close examination the data from Grado and Central Veneto do not provide evidence for nonmyopic harmony, and also that the theory of harmony that incorporates Generalized Prominence-based Licensing constraints overgenerates by predicting undesired nonmyopic effects.

I have also demonstrated that the harmonic systems of Baiyinna Orochen and Mọbà Yorùbá do not constitute evidence in favor of nonlocal harmony-driving constraints, because they are not instances of trigger-target asymmetries in the sense that there is a non-trigger acting as an intermediate transmitter of harmony. In Baiyinna

Orochen the generalization that long mid back rounded vowels do not act as triggers word-initially but transmit it word-medially does not hold because initial long mid back rounded vowels are diphtongs with a [+high] element that makes them members of the neutral class that includes high vowels and front vowels. In medial position, however, they are plain back rounded vowels and therefore harmony participants. Harmony can thus procede locally across the vowel sequence and it does not have to be encoded in a nonlocal constraint. In Mọbà Yorùbá there is not a single nonlocal process of nasal harmony, but several processes each of which is local: intrasyllabic harmony operates under strict adjacency, and word-level harmony is a typical vowel-harmonic process that spreads across consonants with an opaque class (nonhigh vowels). The fact that *m* is not a trigger, as in *ùmoɲì*, is derived from the fact that it is not a member of the class of nasal vowels {ĩ, ũ, ã}. The alledged fact that it is a transmitter derives from the artifact of collapsing two different processes in one. The nasal *m* has the same status as *s* and *gb* in /ìsùgbĩ̀/ → [ĩ̀sũ̀gbĩ̀]. As a general conclusion, myopic harmony does not show, given current evidence, any nonlocal trigger-target asymmetries.

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[1] I have been unable to locate the single example in (2a) in the sources.

[2] The version I have of Belluni's dictionary is more recent than Belluni (2000) consulted by Walker, but the versions are very similar. I have made slight adaptations; the plural forms are derived from the conventional notations in the dictionary, where the full plural is always indicated when there is raising of the tonic; in the case of *zóveno - zóveni* the form *zóveni* is explicitly included in the entry.

[3] This changing situation is described in Tarlao (1983), Rizzi (1989), and Bottin (2003).

[4] Biagio Marin was born in 1891, Bottin's six informants between 1913 and 1932. The informants in Cortelazzo's 1971 survey were from all ages; he doesn't give precise indications.

[5] In Marin I found two cases of nonraising in proparoxytones, *ciàcoli, poveri*, and six cases of raising. Both *ciàcoli* and *poveri* show post-tonic raising in Bottin (2003), where I found 31 cases of raising of the post-tonic after an opaque tonic. Exceptional nonraising extends also to nonmyopic forms, e.g. *liberi, núvoli*, which indicates that raising has exceptions that affect both "myopic" and regular proparoxytones.

[6] The ortographic form in the poems in Marin shows *e* to *i* and *o* to *u* raising; etymology and failure of raising indicates the mid open character of *e*, *o*.

[7] I adopt the $\forall$(F/C, P) format given in NTTR. The general format in Walker (2011:45) is License(λ, π), where a violation mark is assigned to any λ_j for which $\exists\lambda_j(P(\lambda_j)) \wedge \forall\lambda_j(\neg\text{Coincide}(\lambda_j, p))$. P are the restrictions on λ_j that correspond to C in NTTR, and Coincide(λ_j,p) means that λ_j, usually a feature, is exactly the same instance as p (p is an instace of a prominent position π), or one dominates the other. The licensing constraints in Walker (2005) do not differ substantially.

[8] To make the underlying representations closer to NTTR, the underlying form of harmonizing vowels appears with the tongue root value already determined by RTR harmony, i.e. either /a/ or /ə/.

[9] Since the trigger vowel is not restricted to initial position or to an input vowel, (15a) *bolboxi-wə*, with two instances of a short round mid vowel, should incur four violations and not two, predicting **bolbəxi-wə*. This might be avoided by reformulating (12), but notice that the trigger can be noninitial, as in the examples in fn 10.

[10] In borrowed disharmonic stems long mid back vowels trigger regular RTR harmony, and for some speakers, they do trigger regular round harmony (Li 1996:133): *xujko-loo-tʃo* 'to discount' (cf. *faʃə-ləː-tʃə* 'to launch'), *xuibɔː-lɔː-tʃɔ* / *xuibɔː-laː-tʃa* 'to report' (cf. *dʒixua-laːw-tʃa* 'to plan').

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