Reduplicative Identity in Chaha

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June 1998

1. Introduction

In this paper we discuss the process of continuant dissimilation in Chaha (a Western Gurage language of Ethiopia) which derives [k] from /x/. We argue that the notion of correspondence is crucial to an adequate account of the process. In particular, two different correspondence relations are at play: Base-Reduplicant correspondence (McCarthy & Prince 1995) and Output-Output correspondence (Benua 1995, Burzio 1996, Ito & Mester 1997, Kenstowicz 1996, Steriade 1997, among others). Chaha reduplication is of more than passing interest because it provides a clear example of "back copy" in which the output of reduplication triggers a change in its correspondent (a phenomenon first identified by Wilbur 1973). McCarthy & Prince (1995) observe that back copy is expected under a constraint-based approach to reduplication but is problematic for the traditional serial derivational model. While a number of cases of back copy have been reported in the literature, they derive largely from secondary sources and have proven difficult to confirm (e.g. Malay nasal harmony discussed in McCarthy & Prince 1995 based on Onn 1976; see Kenstowicz 1980 for discussion). It is therefore important to document additional cases of this phenomenon--our purpose in this paper.

In (1) we give the inventory of consonants in Chaha.

(1)

voiceless ejective			t'	c'	k'^{y}, k', k'^{w}
voiceless	p, p^{w}		t	c	k^{y}, k, k^{w}
voiced		b, b^{w}		d	j g^{y}, g, g^{w}
voiceless	f, f^{w}	s	•		x^{y},x,x^{w}

voiced			z	3	9
nasal	m, m^w	n	ñ	•	
approximant	•, w	r (l)	y		

The basic opposition in the stops is between voiceless ejectives and voiced. The voiceless series arises from the devoicing of voiced stops in certain morphological positions (arguably geminated, though on the surface all consonants are simplex in Chaha; see Petros 1997). There are two further gaps: there is no labial ejective (a cross-linguistically common state of affairs--Greenberg 1970) and in fricatives a voice contrast only appears in the coronal series. The stop [b] derives from an approximate /•/ while [k] has two sources: devoicing of /g/ in certain contexts (Petros 1997) as well as a reflex of /x/ when followed by another continuant /f,s,z,x,9/ or when underlyingly geminate. Finally, the pharyngeal /9/ is realized as a vowel [a] or [*ƒ*].

In terms of its morphology Chaha is a Semitic language in which radicals express lexical meaning in verbs (and derived nominals): roots are characterized lexically by two, three, or four consonants. Verbs are inflected for several tense/aspect forms including perfective, imperfective, and jussive (imperative).

2. Complementary distribution of [x] and [k]

First we present the evidence that [k] and [x] are in noncontrastive distribution with /x/ as the default value chosen without regard to context. Putting aside the middle radical position of perfective verbs where [k] is a devoiced /g/ or a simplified geminate /x/ (see Petros 1997), [k] has a very restricted distribution in Chaha in comparison to the other stops. First, it never appears as a final radical (unless reduplicated--see below). Only [x] is found in this position (2). (Perfect verbs are inflected with subject suffixes which are suppressed here for convenience.)

(2)

imperative	imperfect	perfect		
yƒ-frƒx	yÓi-fƒrx	fƒnƒx	'tolerate'	/frx/
yƒ-mƒs(Ói)x	yÓi-mes(Ói)x	mesƒx	'chew'	/msx/
yƒ-f^{w}(Ói)x	yÓi-f^{w}ƒx	f^{w}ƒx	'wipe out'	/fwx/
yƒ-frat(Ói)x	yÓi-frat(Ói)x	fÓiratƒx	'mess'	/frtx/
yƒ-srƒx	yÓi-sƒrx	sƒnƒx	'be weakened'	/srx/
yƒ-t-•amƒx	yÓi-t-•amƒx	tƒ-•amƒx	'lean on'	/•mx/
yƒ-marx	yÓi-manx	manƒx	'capture	/mrx/
yƒ-rax	yÓi-rƒx	nax	'send'	/rx/
yƒ-•tÓix	yÓi-•ƒtx	bƒtƒx	'uproot'	/•tx/
yƒ-tÓimx	yÓi-tƒmx	tƒmƒx	'dip out'	/tmx/
yƒ-tÓirx	yÓi-tƒrx	tƒnƒx	'make incisions'	/trx/

In the Chaha lexicon there are some 12 verbs in this class. We know of just a single root ending in [k]--yƒ-•arÓik 'to bless' an Amharic loanword (proven among other things by its telltale medial [r]--medial sonorants are regularly nasalized in Chaha; see Petros 1997:108-9) .

As an initial radical, [x] appears unless a [+contin] [f,s,z,9] follows in the root. There are some 25 example of this case (Petros 1997:100-101). A few are given in (3) in the jussive.

(3)

y-a-xƒtÓir	'precede'	/xtr/
yƒ-xdÓir	'thatch'	/xdr/
yƒ-xrƒm	'spend year'	/xrm/
yƒ-x•Ói•	'encircle'	/x•/
yƒ-x^{w}ƒrÓir	'amputate	/x^{w}r/

Compare these with cases in (4) where the second or the third radical is a continuant [f,s,z,9].

(4) yʃ-k**fÓ**ir 'separate' /xfr/

yʃ-kÓi**f**t 'open' /xft/

yʃ-k**z**ʃ• 'become inferior' /xz•/

yʃ-k**s**ʃr 'strain, become charcoal, go bankrupt' /xsr/

yʃ-kʃ• 'crush' /x•/

yʃ-k•ʃ• 'be prickly' /x•/

y-a-k^{w}ʃ• 'remove fibers' /x^{w}•/

yʃ-kʃ**s**Ós 'accuse' /xs/

y-a-k^{y}ʃ**s** 'joke' / x^{y}s/

yʃ-k^{y}a**f** 'drizzle' / x^{y}f/

yʃ-ktÓi**f** 'hash' /xtf/

y-a-k•a•**s** 'make dirty' /x•s/

yʃ-kad 'deny' /x9d/

yʃ-ka• 'pile' /x9•/

Finally, (5) shows cases involving the medial radical. It is [k] only when a following radical is a fricative (5a); otherwise [x] occurs (5b).

(5) a. yʃ-•kÓi**s** 'bite' /rxs/

y-a-•ʃ•kÓi**s** 'give as pretext' /•rxs/

y-a-•kÓi**s** 'light the fire' /rxs/

y-ʃkÓi**s** 'wait' /9xs/

yʃ-•kÓi**f** 'provoke a quarrel' /rxf/

yʃ-tÓik**s** 'burn' /txs/

yʃ-tʃk^{w}Ói**s** 'fire a gun' /tx^{w}s/(< Amharic)

yʃ-mʃrk^{w}Ós 'be a monk' /mrx^{w}s/ (< Amharic)

yÓi-fʃka 'escape' /fx9/

yÓi-mʃka 'trouble' /mx9/

yÓi-tʃka 'replace' /tx9/

	yƒ-wka	'ferment'	/•^{w}x9/
b.	yƒ-txƒr	'diminish'	/txr/
	yƒ-fxƒr	'multiply'	/fxr/
	yƒ-•xƒ•	'find'	/rx•/
	yƒ-sx^{y}	'flee'	/sx^{y}/
	yƒ-srax(Ói)t	'mess up'	/srxt/

As shown by yƒ-fxƒr 'multiply', yƒ-sx^{y} 'flee', and yƒ-frƒx 'tolerate' [x] freely follows a fricative; the dissimilation from [x] to [k] is thus regressive in nature.

To sum up, we have found some 100 plus verbs in which one of the radicals is [k] or [x]. [k] appears just in case there is a following radical that is drawn from the [+contin] series [f,s,z,9]. Only a few exceptions to this generalization exist. First, two verbs with initial radical [x] fail to dissimilate when the final radical is [9]: xƒna 'prohibit' and xƒna 'shout', both from /xn9/. If there are to be exceptions to the dissimilation generalization then it is not surprising that we find them in /xC9/ roots. First, the laryngeal [9] is more weakly connected to the [+contin] class than the oral fricatives [f,s,z]. Second, the /9/ is realized as a vowel. It's exponence is thus less transparent than the other fricatives. Third, these are cases where the distance between the site and the source of the dissimilation process is greatest (see Pierrehumbert 1993, Frisch, Broe, & Pierrehumbert 1995 for distance effects on OCP-driven constraints in Arabic). We have found just one verb where [x] is followed by an oral fricative--yƒ-t-raxƒs 'let him bite/quarrel'--a true exception . Finally, there are a handful (five or less) of Amharic loans where [k] occurs when not followed by a fricative.

We express the dissimilation by the constraint in (6)--an instantiation of the OCP[1].

(6) *[x] ..... [-sonorant
+continuant]

In order to allow any discrepancy between the underlying and surface form, *x ... [+contin] must dominate the faithfulness constraint IO-Ident[contin] that penalizes a change in the input value for [contin]. Since dissimilation is expressed as a static phonotactic constraint, it could be satisfied by changing the point of articulation of /x/. To block this outcome we assume that faithfulness for place in consonants ranks higher than faithfulness for [continuant]. Finally, the constraint could also be satisfied by changing the following fricative into a stop instead of changing the [x]. This would make the dissimilation progressive rather than regressive. We do not have a good answer as to why the first fricative is changed instead of second. One possibility is to capitalize on the fact that [f,s,z] are strident while [x] is not. Changing [f,s,z] to the corresponding stops [p,t,d] would involve a change in both continuancy and stridency while the change of [x] to [k] changes just continuancy. Alternatively, if constraints aligning individual features with the edge of the word appear in the repertoire of UG constraints, then Align-[-contin]-Left >> Align-[-contin]-Right will also express the regressive nature of dissimilation.

The tableaus in (7) show how the complementary distribution of [x] and [k] is expressed in Chaha. For the /xfr/ root the dissimilation constraint (6) blocks the most faithful candidate y*ƒ*-xfÓir. Evaluation for faithfulness with respect to Place discards the candidate that changes the articulator of [x] (e.g. into a coronal: y*ƒ*-sfÓir). Finally, faithfulness for stridency (or alignment of [-continuant]) chooses y*ƒ*-kfÓir over y*ƒ*-xpÓir. In the second tableau showing the derivation of the /xtr/ root, [x] is not followed by a fricative and so any departure from faithfulness is penalized.

(7)

/yʃ-xfÓir/	*x...[+contin]	IO-Ident[Pl]	IO-Ident[contin]	IO-Ident[str]
yʃ-xfÓir	*!			
$yʃ-kfÓir			*	
yʃ-sfÓir		*!		
yʃ-xpÓir			*	*!

/ya-xʃtÓir/	*x...[+contin]	IO-Ident[Pl]	IO-Ident[contin]	IO-Ident[str]
$ya-xʃtÓir				
ya-kʃtÓir			*!	

3. Reduplication

We now turn to reduplication--the focus of this paper. Three types are relevant to reduplicative identity in Chaha. First, biradical verbs may take a disyllabic CVCCVC template which is filled by reduplicating both radicals: /12/ -> 1212. Second, when biradicals are assigned to a template calling for three consonants, the second radical is copied: /12/ -> 122. Finally, frequentative verbs are expressed by doubling the middle radical: /123/ -> 1223. See McCarthy (1986), Rose (1997), Petros (1997), and Gafos (1998) for discussion. Let us examine each type of reduplication.

3.1 Total Reduplication

We begin with the /12/ -> 1212 pattern. When the initial radical is /x/ and the second radical is drawn from the [f,s,z,9] continuant set, we find dissimilation of each occurrence of /x/. This is expected since each correspondent under Base-Reduplicant identity is immediately followed by a fricative and hence will be subject to the dissimilation constraint of (6).

(8) kʃskÓis /xs/ 'smash'

a-•-kaka /x9/ 'cackle'

kaka /x9/ 'dry totally'

kyʃkyÓif /x^{y}f/ 'sprinkle'

More interesting are cases where /x/ is located in the first position but the second radical is not a fricative. Remarkably, in this case both instances of /x/ are realized as velar stops. In some cases the medial cluster is simplified through deletion of the first member (Petros 1997: 179-86).

(9) kʃtkÓit /xt/ 'crush'

a-•-k^{w}ʃtk^{w}ʃt /x^{w}t/ 'remove weeds'

kʃkÓim /xm/ 'trim'

a-•-k^{w}ʃrk^{w}Óir /x^{w}r/ 'make lump'

kʃkÓir /xr/ 'hold in armpit'

We understand this behavior as follows. Since [x] is a fricative, it falls under the second term of the *x...[+contin] constraint. The dissimilation process thus reaches across the juncture between the base and reduplicant (which is very weak in Chaha, given that the base and reduplicant jointly fill out the verbal template). The truly remarkable fact is that the second occurrence of /x/ must be changed to a stop as well. This "overapplication" of the /x/ -> [k] change makes sense in the system developed by McCarthy & Prince (1995): it is a matching effect under Base-Reduplicant Identity. Given that identity is a symmetric relation, the correspondence model allows a change to be introduced in the source of the dissimilation process. Let us see why by looking at the analysis in more detail.

Since the /12/ -> 12#12 structure involves complete reduplication, we cannot tell which piece is the base and which is the reduplicant. In either case there is a matching effect under correspondence whereby /x/

is unexpectedly realized as /k/ in order to maximize similarity between the base and the reduplicant. If dissimilation is regressive in Chaha, it must be the second /x/ that is changed under B-R identity. If the structure is [reduplicant+base], then we have an instance of "back copy" in which the source of the reduplication is modified in response to a change in the copy (triggered by the base itself). If the structure is [base+reduplicant], then the reduplicant figures in two changes: first it creates the context for dissimilation; second, it maintains identity with its base correspondent--another case of "back copy". In (10) we show the tableaus under both scenarios. So long as the Base-Reduplicant faithfulness constraint evaluating for identity in the feature [continuant] ranks above the Input-Output constraint that evaluates for identity in the same feature, "overapplication" of the /x/ -> [k] change in ensured.

(10)

/red+xt/	BR-Ident[contin]	*x..[contin]	IO-Ident[contin]
xʃtxÓid		*!	
kʃtxÓid	*!		
$kʃtkÓid			*
xʃtkÓid	*!		*

/xt+red/	BR-Ident[contin]	*x..[contin]	IO-Ident[contin]
xʃtxÓid		*!	
kʃtxÓid	*!		
$kʃtkÓid			*
xʃtkÓid	*!		

As McCarthy & Prince (1995) point out in their discussion of Malay, such cases present a paradox for the derivational model. If the structure is /xÓid=red/ then we must wait until reduplication applies in order to set up context for dissimilation: /xÓid+xÓid/. If dissimilation is regressive in Chaha, /kÓid+xÓid/ is the expected outcome. There is

no independently motivated way to change the reduplicated /x/ to [k]. [Petros (1997) invokes an adhoc constraint barring two different allophones of /x/ in a root. But this follows by BR-Ident.] McCarthy & Prince (1995) suggest making the copy rule an "anywhere" rule that persistently copies the base (11). This will allow the dissimilative change to the base (triggered by the reduplicant) to be carried back over to the reduplicant. But as they point out, the rule's Structural Description must be expressed in such a way that it applies just in case the base and reduplicant are not identical. This recapitulates what is expressed directly by the BR-Identity correspondence constraint. Moreover, being an anywhere rule, persistent copy will inevitably reproduce in the reduplicant the effect of any other change in the base. By contrast, BR-Identity is a rankable constraint and so will not necessarily have this feature.

(11) /xÓid=red/

xÓid=xÓid	copy
kÓid=xÓid	regressive dissimilation
kÓid=kÓid	copy

If the structure is /red=xÓid/ then we have the situation McCarthy & Prince dub "back copy". This is impossible for the standard theory to express in terms of rules because the reduplicant copies the base and not vice versa. Furthermore, allowing persistent enforcement of copy by making it an anywhere rule has the stultifying effect of always undoing the dissmilative process. Finally, if dissimilation is also made persistent then the rules fall into an infinite regress and the derivation never terminates.

(12) /red=xÓid/

xÓid=xÓid	copy
kÓid=xÓid	regressive dissimilation

xÓid=xÓid copy

kÓid=xÓid regressive dissimilation

:

:

3.2 Final Reduplication

We now consider /12/ -> 122 and /123/ -> 1233 reduplications where the final radical is /x/. (See Petros 1997, Rose 1997, and Gafos 1998 for arguments that the realization of /12/ roots as 122 involves reduplication and not long-distance spreading.) Examples appear in (13).

(13) sÓikÓik 'drive a peg' /sx/

a-f^{w}kÓik 'squat' /f^{w}x/

ʃkÓik 'scratch' /?x/

b^{w}ʃkʃk 'talk a lot' /b^{w}x/

yʃ-t-mʃrkʃk ‘kneel down’ /mrx/

Once again if dissimilation is regressive in Chaha then the second /x/ dissimilates the first one to a stop and the [-continuant] feature is copied onto the source of the dissimilation through reduplicative identity. The tableaus in (14) show the outcomes under suffixal (14a) or infixal (14b) reduplication.

(14) a.

/sx+red/	BR-Ident[contin]	*x..[contin]	IO-Ident [contin]
sÓixÓix		*!	
sÓikÓix	*!		*
$sÓikÓik			*

b.

/s+red+x/	BR-Ident[contin]	*x..[contin]	IO-Ident [contin]

sÓixÓix	*!	
sÓikÓix	*!	
$sÓikÓik		*

The derivational model encounters the same problems here as with the /12/ -> 1212 cases discussed above.

3.3 Medial Reduplication

Finally, we consider the /123/ -> 1223 reduplication. This pattern forms the frequentative of the verb. When the second radical is /x/ and the third is a fricative, we find the dissimilated [k] throughout, as expected.

(15)

imperative	imperfect	perfect		
nÓikʃk(Ói)s	yÓi-rkʃk(Ói)s	nÓikʃkʃs	'bite'	/rxs/
tÓikʃk(Ói)s	yÓi-tkʃk(Ói)s	tÓikʃkʃs	'burn'	/txs/
tʃ-rkakʃf	yÓi-tÓi-rkakʃf	tʃ-rkakʃf	'quarrel'	/rxf/
a-fkaka	y-a-fkaka	a-fkaka	'vanish'	/fk9/

More interesting are verbs in which the second radical is /x/ but the third is not a fricative. Reduplication of the middle radical creates a /x/+/x/ sequence; the first /x/ should dissimilate to [k] and by BR-Identity we expect the second one to follow suit and surface as [k] as well. The surprise is that this does not happen in the imperative, where both the base and reduplicant remain as fricatives.

(16)

imperative	imperfective	perfective	
tʃ-sxaxʃr	yÓi-t-sÓikakʃr	tʃ-skakʃr	'act naughtily'
tʃ-mxaxʃr	yÓi-tÓi-mkakʃr	tʃ-mkakʃr	'advise each other'
tʃ-rxʃxʃ•	yÓi-tÓi-rkʃkʃ•	tʃ-rkʃkʃ•	'show up'

We understand this behavior as follows. Unlike in the /12/ -> 1212 and /12/ -> 122 patterns discussed above, /123/ -> 1223 reduplication is "morphological" in the sense that the reduplicated form is morphologically related to an independently occurring base form. We show in (17) the paradigms for the corresponding nonfrequentative verbs of (16) and (15).

(17)

imperative	imperfective	perfective		
sÓixʃr	yÓi-sxʃr	sʃkʃr	'get drunk'	/sxr/
mÓixÓir	yÓi-mExÓir	mʃkʃr	'advise'	/mxr/
nÓixʃ•	yÓi-rʃxÓi•	nʃkʃ•	'find'	/rx•/
nÓik(Ói)s	yÓi-rʃk(Ói)s	nʃkʃs	'bite'	/rxs/
tÓik(Ói)s	yÓi-tʃk(Ói)s	tʃkʃs	'burn'	/txs/
nÓik(Ói)f	yÓi-rʃk(Ói)f	nʃkʃf	'quarrel'	/rxf/
fÓika	yÓi-fʃka	fʃka	'flee'	/fk9/

The problem is thus to explain why in tʃ-sxaxʃr the first /x/ does not dissimilate to [k], given the presence of the second /x/ of the /sxr/ root. We see this as the intervention of another correspondence constraint blocking dissimilation in order to maintain identity in the feature [continuant] with respect to the morphologically related nonfrequentative form sÓixʃr. See Benua 1995, Burzio 1996, Kenstowicz 1996, Ito-Mester 1997, Steriade 1997, for discussion and additional examples of such Output-Output constraints. In tableau (18) we assume that the first C is the Reduplicant (based on its fixed a-vocalism) and the second is the Base (whose vocalism varies according to the aspect of the verb). BR-Identity for [continuant] rules out mixed forms in which the base and reduplicant do not match. The O-O constraint requiring the second radical of the frequentative to match that of the morphologically

basic nonfrequentative form excludes the candidate skak*ʃ*r with a stop, leaving the sxax*ʃ*r candidate as the only viable alternative. It violates *x...[+contin] but since O-O ranks higher the dissimilated skak*ʃ*r competitor has been eliminated. These data also tell us that the BR-Ident[contin] constraint must outrank *x..[+contin]. Otherwise, skax*ʃ*r would be the winner.

(18) /sxr, cCac*ʃ*c/	BR-Id[contin]	O-O[contin]	*x...[+contin]
$sxax*ʃ*r			*
skax*ʃ*r	*!		
skak*ʃ*r		*!	
sxak*ʃ*r	*!	*	

Given that the OO-Ident[contin] constraint holds between two separate output forms, it blocks dissimilation in the "morphological" reduplication found in the /123/ -> 1223 pattern. But precisely because the /12/ -> 1212, 122 reduplications apply to the root (and are thus "phonological" in the sense of Prunet & Petros 1996), there is no independently occurring output form that can block dissimilation for these formations. Dissimilation thus applies freely.

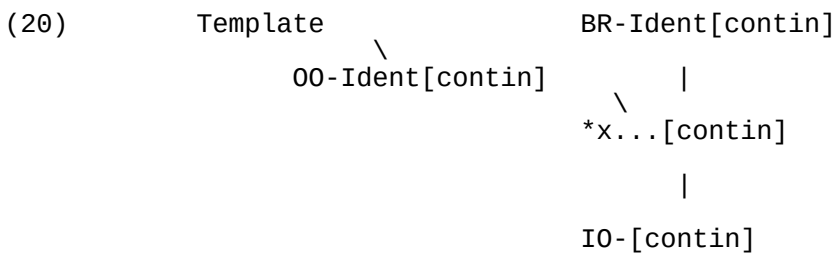
Finally, we must explain why the OO-Ident[contin] constraint does not block a stop in the imperfective forms: cf. yÓi-t-sÓika**k***ʃ*r vs. yÓi-s**x***ʃ*r. The answer is that the template for the imperfective of the derived frequentative verbs requires the penultimate radical to be a stop (due to gemination (Petros 1997)): cf. simple yÓi-s*ʃ*•Óir vs. frequentative yÓi-s•*ʃ***pÓ**ir 'break'. This templatic requirement thus must dominate the Output-Output matching constraint for [continuant].[2]

(19) /sxr, cCacc*ʃ*c/	template	BR-Iden[contin]	OO-[contin]
sÓixax*ʃ*r	*!		
sÓikax*ʃ*r	*!	*	
$sÓikak*ʃ*r			*

	sÓixakʃr	*!	*

The Hasse diagram in (20) reviews the crucial constraint rankings of the proposed analysis.

(20)



4. Conclusion

In this paper we have documented a case of reduplicative identity. We first demonstrated that [x] and [k] are in complementary distribution in Chaha with [k] deriving from underlying /x/ when a [+continuant] consonant follows in the root. We then examined three types of reduplication: /12/ -> 1212; /12/ -> 122; and/123/ -> 1223. When the reduplicating radical is /x/ both the reduplicant and the corresponding base phoneme are realized as stops. Since [x] is a continuant, it falls under the second term of the dissimilation process and will accordingly require that the preceding [x] dissimilate to a stop. The systematic change of the second [x] to [k] is an instance of reduplicative identity. It follows from ranking B-R Identity for [continuant] above the Input-Output faithfulness constraint for [continuant] and thus is an analytic option predicted by the OT model in terms of its basic formalism of constraint ranking. As noted originally by Wilbur (1973), the traditional derivational model in which reduplication is expressed by a copy rule applying at some fixed point in the derivation in unable to describe this phenomenon adequately. Finally, we noted some cases where the expected dissmilation is blocked in the /123/ -> 1223 pattern forming frequentative verbs. These were argued to reflect an Output-Output constraint requiring the radicals to match the corresponding base

forms in the feature [continuant]. This Output-Output effect is itself overridden by templatic requirements which force a stop in the face of a corresponding continuant in the nonfrequentative verb.

While we believe that the evidence for reduplicative identity in Chaha is strong it should be noted that our analysis is based on a finite corpus of data--some 100 plus roots. While the generalizations holding over this finite set are clear and natural, the set cannot be extended and so the productivity of the pattern cannot be demonstrated directly. The skeptic could thus argue that the pattern we have claimed to identify is an illusion. We have no argument against this position other than to observe that if it is consistently enforced then many other generalizations that have been cornerstones of Generative Phonology (English Vowel Shift, Yawelmani high vowels, Arabic root OCP effects) would also be called into question. Clearly, more cases of reduplicative identity must be documented in order to secure the existence of the phenomenon--one that receives a natural expression in the Correspondence Theory of McCarthy & Prince (1995) but is puzzling in the rule-based derivational model of traditional Generative Phonology.

Notes

[1]With respect to the second term in the constraint, it is noteworthy that the pharyngeal /9/ dissimilates a preceding /x/, while the approximant /•/ does not. This suggests that /9/ ranks lower on the sonority scale. Also, the limitation of the first term in the constraint to the velar continuant is perhaps more principled when gaps in the inventory of stops vs. fricatives in the overall system are considered. For the labials there are no independently occurring stops: all derive from the underlying approximant /•/. There is thus a high ranking constraint barring labial stops which might also be at play in blocking any dissimilation of /f/ to [p]. For the dorsals, while there is no independent /k/ the voiced stop /g/ exists in the inventory.

Dissimilation of /x/ to [k] thus fills a hole in the phonetic inventory. Finally, at the dental position, both voiced and voiceless stops and fricatives contrast. Dissimilation of /s/ or /z/ to a stop would merge a contrast. Thus, judicious appeal to notions of contrast and gaps may provide a more principled basis for the restriction of constraint (6) to the dorsal fricative. However, we will not pursue this point as it is not relevant to reduplication.

[2]The difference between [•] and [p] is not one of [±contin] but [±sonorant] (see Petros 1997). Hence, BR-Ident[contin] does not apply in yÓi-s•ƒpÓir 'break'.

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