Reduplicative Identity in Chaha

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The article discusses the process of continuant dissimilation that derives [k] from /x/ in Chaha (a Western Gurage language of Ethiopia) and its implications for reduplicative identity. It is argued that two correspondence relations are crucial to an adequate analysis of the process: base-reduplicant correspondence and output-output correspondence. Chaha provides a clear instance of ''back copy'' in which the output of reduplication triggers a change in the base.

Keywords: Chaha, Gurage, reduplication, correspondence

1 Introduction

In this article we discuss a process of continuant dissimilation that derives [k] from /x/ in Chaha (a Western Gurage language of Ethiopia); we focus on the implications of this process for reduplicative identity. 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 and Prince 1995) and output-output correspondence (e.g., Benua 1995, Burzio 1996, Itô and Mester 1997, Kenstowicz 1997, Steriade 1997). 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 and Prince (1995) observe that back copy is expected under a constraint-based approach to reduplication but is problematic for the traditional serial derivational model. Although 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 and Prince 1995, based on Onn 1976; see Kenstowicz 1981 for discussion). It is therefore important to document additional cases of this phenomenon—our purpose in this article.

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

(1)				
voiceless ejective		t'	c'	k'^{y}, k', k'^{w}
voiceless stop	p, p^w	t	c	k^y, k, k^w
voiced stop	b, b^w	d	j	g^y, g, g^w
voiceless continuant	f, f^w	s	ʃ	x^y, x, x^w
voiced continuant		z	ʒ	
nasal	m, m^w	n	ñ	ŋ
approximant	β, w	r (l)	y	

The basic phonological opposition in the stops is between voiceless ejective and voiced. The voiceless series mainly arises from the devoicing of voiced stops in certain morphological positions (arguably geminated, though on the surface all morpheme-internal consonants are simplex in Chaha; see Banksira 1997 for details). There are three gaps in the system. First, there is no labial ejective (a crosslinguistically common state of affairs; see Greenberg 1970). Second, the guttural series found in other Semitic languages has collapsed into a single underlying segment in Chaha, represented here as the pharyngeal /ʔ/. This continuant is realized as [a] or [ə]. See Banksira 1993, 1997 for details. Finally, the stop [b] derives from an approximant /β/ whereas [k] has two sources: it arises from devoicing of /g/ in certain contexts (Banksira 1997), and it is the reflex of /x/ when followed by another continuant /f,s,z,x,ʔ/ or when underlyingly geminate.

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 perfect, imperfect, and jussive (imperative). Our study is based on the analysis of Chaha presented in Banksira 1993, 1997, which examines approximately 1,000 verbal roots.

2 Complementary Distribution of [x] and [k]

First we present the evidence that [k] and [x] are in complementary distribution with /x/ as the default value chosen without regard to context. Putting aside the middle radical position of perfect verbs where [k] is a devoiced /g/ or a simplified geminate /x/ (see Banksira 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). (In what follows the jussive and imperfect forms are cited in the 3sg. masculine, and the subject-marking suffixes on perfect verbs are suppressed for convenience.)

(2) | *Jussive* | *Imperfect* | *Perfect* | | |
|---|---|---|---|---|
| yə-frəx | yɨ-fərx | fənəx | 'tolerate' | /frx/ |
| yə-məs(ɨ)x | yɨ-mes(ɨ)x | mesəx | 'chew' | /mysx/ |
| yə-fʷ(ɨ)x | yɨ-fʷəx | fʷəx | 'wipe out' | /fwx/ |
| yə-frat(ɨ)x | yɨ-frat(ɨ)x | fɨratəx | 'mess' | /frtx/ |
| yə-srəx | yɨ-sərx | sənəx | 'be weakened' | /srx/ |
| yə-t-ʃaməx | yɨ-t-ʃaməx | tə-ʃaməx | 'lean on' | /symx/ |
| yə-marx | yɨ-manx | manəx | 'capture' | /mʔrx/ |
| yə-rax | yɨ-rəx | nax | 'send' | /rʔx/ |
| yə-βtɨx | yɨ-βət(ɨ)x | bətəx | 'uproot' | /βtx/ |
| yə-tɨmx | yɨ-təmx | təməx | 'dip out' | /tmx/ |
| yə-tɨrx | yɨ-tərx | tənəx | 'make incisions' | /trx/ |

In the Chaha lexicon there are about 12 verbs in this class. We know of just a single root ending in [k]: *yɨ-βarɨk* imp., *barək* perf. 'to bless', an Amharic loanword (proven by, among other things, its telltale medial [r]—medial sonorants in this morphological context are regularly nasalized in Chaha; see Banksira 1997:108–109).

As an initial radical, [x] appears unless a [+continuant] /f,s,z,^{7}/ follows in the root. There are about 25 examples of this case (Banksira 1997:100–101). A few are given in (3) in the 3sg. masc. jussive.

(3) y-a-xətir   'precede'   /xytr/
 yə-xdɨr   'thatch'   /xdr/
 yə-xrəm   'spend year'   /xrm/
 yə-xβɨβ   'encircle'   /xβ/
 yə-xʷərɨr 'amputate'   /xwr/

Compare these with the cases in (4), where the second or third radical is a member of the continuant set [f,s,z,^{7}].

(4) yə-kfɨr   'separate'   /xfr/
 yə-kift   'open'   /xft/
 yə-kzəβ   'become inferior' /xzβ/
 yə-ksər   'strain, become charcoal,
          go bankrupt'   /xsr/
 yə-kəʃ   'crush'   /xsy/
 yə-kʃəʃ   'be prickly'   /xsy/
 y-a-kʷəʃ 'remove fibers' /xwsy/
 yə-kəsɨs   'accuse'   /xs/
 y-a-kʸəs 'joke'   /xys/
 yə-kʸaf   'drizzle'   /xyf/
 yə-ktif   'hash'   /xtf/
 y-a-kβaβs 'make dirty'   /xβs/
 yə-kad   'deny'   /x^{7}d/
 yə-kaβ   'pile'   /x^{7}β/

Finally, (5) shows cases of /x/ in the medial radical position. It is realized as [k] only when a following radical is a continuant (5a); otherwise, [x] appears (5b).

(5) a. yə-ŋkis   'bite'   /rxs/
   y-a-βəŋkɨs   'give as pretext' /βrxs/
   y-a-ŋkɨs   'light the fire' /rxs/
   y-əkis   'wait'   /^{7}xs/
   yə-ŋkif   'provoke a quarrel' /rxf/
   yə-tɨks   'burn'   /txs/
   yə-təkʷis   'fire a gun'   /txws/ (< Amharic)
   yə-mərkʷ s   'be a monk'   /mrxws/ (< Amharic)
   yə-fka   'escape'   /fx^{7}/
   yə-mka   'trouble'   /mx^{7}/
   yə-tka   'replace'   /tx^{7}/
   yə-wka   'ferment'   /βwx^{7}/

b. yə-txər   'diminish'   /txr/
    yə-fxər   'multiply'   /fxr/
    yə-ŋxəβ   'find'   /rxβ/
    yə-sxʸ   'flee'   /sxy/
    yə-srax(i)t   'mess up'   /srxt/

As shown by *yə-fxər* 'multiply', *yə-sxʸ* 'flee', and *yə-frəx* 'tolerate', [x] freely follows a fricative; the dissimilation from [x] to [k] is thus regressive in nature.

To sum up, in a study of over 1,000 basic verbs we have found more than 100 verbs in which one of the radicals is [k] or [x]. [k] appears just in case there is a following radical drawn from the [+continuant] series [f,s,z,ʕ]; otherwise, [x] appears. Only a few exceptions to this generalization exist. First, two verbs with initial radical [x] fail to dissimilate when the final radical is [ʕ]: *xəna* 'prohibit' and *a-xəna* 'shout', both from /xrʕ/. If there are to be exceptions to the dissimilation generalization, then it is not surprising that we find them in /xCʕ/ roots. First, the pharyngeal [ʕ] is more weakly connected to the [+continuant] class than the oral fricatives [f,s,z]. Second, the /ʕ/ is realized as a vowel. Its exponence is thus less transparent than that of 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, and Pierrehumbert 1995 for distance effects on constraints driven by the Obligatory Contour Principle (OCP) in Arabic). We have found just one verb where [x] is followed by an oral fricative: *yə-t-raxəs* 'let him bite repeatedly/quarrel', a true exception. Finally, there are a handful of Amharic loans (five or fewer) where [k] occurs when not followed by a fricative.

We informally express the dissimilation by the phonotactic constraint in (6).

(6) *[x] . . . $\begin{bmatrix} -\text{sonorant} \\ +\text{continuant} \end{bmatrix}$

Limitation of the first term in the constraint to the velar continuant is perhaps more principled when gaps in the inventory of stops versus fricatives in the overall system of Chaha (1) are considered. For the labials there are no independently occurring stops: all derive from the underlying approximant /β/. There is thus a high-ranking constraint barring labial stops that might also be at play in blocking any dissimilation of /f/ to [p]. For the dorsals, although 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 allow the dissimilation to be expressed as *[+continuant] . . . [+continuant]—an instantiation of the OCP. However, we will not pursue this point as it is not specifically relevant to reduplication.

In order to allow any discrepancy between the underlying and the surface forms, *[x] . . . [+continuant] (6) must dominate the faithfulness constraint IDENT_IO ([contin]) that penalizes a change in the input value for [continuant]. 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 for why the first fricative is changed instead of the second. One possibility is to capitalize on the fact that [f,s,z] are strident and [x] is not. Changing [f,s,z] to the corresponding stops [p,t,d] would change both continuancy and stridency whereas changing [x] to [k] changes just continuancy. Alternatively, if constraints aligning individual features with the edge of the word appear in the repertoire of Universal Grammar constraints, then ALIGN-L ([−contin]) ≫ ALIGN-R([−contin]) will also express the regressive nature of dissimilation.

The tableaux in (7) and (8) show how the complementary distribution of [x] and [k] is expressed in Chaha. For the /xfr/ root 'separate' the dissimilation constraint (6) blocks the most faithful candidate *yə-xf r*. Evaluation for faithfulness with respect to place discards the candidate that changes the articulator of [x] (e.g., into a coronal: *yə-sf r*). Finally, faithfulness with respect to stridency (or alignment of [−continuant]) chooses *yə-kf r* over *yə-xp r*. In (8), showing the derivation of the /xdr/ root 'thatch', [x] is not followed by a fricative and so any departure from faithfulness is penalized.

(7) /yə-xfɨr/	*[x] . . . [+contin]	IDENT$_{IO}$(Pl)	IDENT$_{IO}$([contin])	IDENT$_{IO}$([strid])
yə-xfɨr	*!			
☞ yə-kfɨr			*	
yə-sfɨr		*!		
yə-xpɨr			*	*!

(8) /yə-xdɨr/	*[x] . . . [+contin]	IDENT$_{IO}$(Pl)	IDENT$_{IO}$([contin])	IDENT$_{IO}$([strid])
☞ yə-xdɨr				
yə-kdɨr			*!	

3 Reduplication

We now turn to reduplication—the focus of this article. Three types are relevant to reduplicative identity in Chaha. First, biradical verbs may take a disyllabic CVCCVC template that 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. Third, frequentative verbs are expressed by doubling the middle radical: /123/ → 1223. See McCarthy 1986, Prunet and Banksira 1996, Rose 1997, Banksira 1997, and Gafos 1998 for discussion. Let us examine each type of reduplication. We cite reduplicated forms in the imperative—a form equivalent to the jussive minus the agreement prefix.

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,[7]] continuant set, each occurrence of /x/ dissimilates. This is expected since each correspondent under base-reduplicant identity is immediately followed by a continuant and hence is subject to the dissimilation constraint (6). In some cases the medial cluster is simplified through deletion of the first member (Banksira 1997:179–186).

(9) kəskɨs   'smash'   /xs/
     a-ŋ-kaka   'cackle'   /x[7]/
     kaka   'dry totally'   /x[7]/
     kʸəkʸɨf < /kʸəfkʸɨf/   'sprinkle'   /xyf/

More interesting are cases where /x/ is located in the first position but the second radical is not a continuant. Remarkably, in this case both instances of /x/ are realized as velar stops.

(10) kətkɨt   'crush'   /xt/
      a-ŋ-kʷətkʷɨt   'remove weeds'   /xwt/
      kəkɨm < /kəmkɨm/   'trim'   /xm/
      a-ŋ-kʷərkʷɨr   'make lump'   /xwr/
      kəkɨr < /kərkɨr/   'hold in armpit'   /xyr/

We understand this behavior as follows. Since [x] is a continuant, it falls under the second term of the *[x] . . . [+contin] constraint. The dissimilation process thus reaches across the boundary between the base and the reduplicant (which is very weak in Chaha, given that the base and the 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 and Prince (1995): it is a matching effect under IDENT_BR. 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/ → 1212 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. Given that dissimilation is regressive in Chaha, it must be the second /x/ that is changed under IDENT_BR. 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 (11) and (12) we show the tableaux 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 is ensured.

(11)

/red+xt/	IDENT_BR([contin])	*[x] . . . [+contin]	IDENT_IO([contin])
xətxɨt		*!	
kətxɨt	*!		
☞ kətkɨt			*
xətkɨt	*!		*

(12)

/xt+red/	IDENT_BR([contin])	*[x] . . . [+contin]	IDENT_IO([contin])
xətxɨt		*!	
kətxɨt	*!		
☞ kətkɨt			*
xətkɨt	*!		*

As McCarthy and Prince (1995) point out in their discussion of Malay, such cases present a paradox for the derivational model. If the structure is /xt + red/, then it is not until reduplication applies that the context for dissimilation is set up: /xət + xɨt/. Given that dissimilation is regressive in Chaha, /kət + xɨt/ is the expected outcome. There is no independently motivated way to change the reduplicated /x/ to [k]. Banksira (1997) invokes a constraint specific to Chaha barring two different allophones of /x/ in a stem. But this follows directly by IDENT_BR.

McCarthy and Prince (1995) entertain the idea of making the copy rule an ''anywhere'' rule that persistently copies the base. This maneuver allows the derivation in (13).

(13) /xt + red/
    xət + xɨt   copy
    kət + xɨt   regressive dissimilation
    kət + kɨt   copy

This allows 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 the reduplicant are not identical. This recapitulates what is expressed directly by the IDENT_BR 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, IDENT_BR is a rankable constraint and so will not necessarily have this feature.

If the input structure is /red + xt/, then we have the situation McCarthy and 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 dissimilative process. Finally, if dissimilation is also made persistent, then the rules fall into an infinite regress and the derivation never terminates (14).

(14) /red + xt/

xət + xɨt	copy
kət + xɨt	regressive dissimilation
xət + xɨt	copy
kət + xɨt	regressive dissimilation
⋮	

3.2 Final Reduplication

We now consider /12/ → 122 and /123/ → 1233 reduplications where the final radical is /x/. (See Banksira 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 (15).

(15)

sɨkɨk	'drive a peg'	/sx/
a-fʷkɨk	'squat'	/fwx/
əkɨk	'scratch'	/ʔx/
bʷəkək	'talk a lot'	/βwx/
tə-mərkək	'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 tableaux in (16) and (17) show the outcomes under suffixal (16) or infixal (17) reduplication.

(16)

/sx+red/	IDENT_BR([contin])	*[x] . . . [+contin]	IDENT_IO([contin])
sɨxɨx		*!	
sɨkɨx	*!		*
☞ sɨkɨk			*

(17)

/s+red+x/	IDENT_BR([contin])	*[x] . . . [+contin]	IDENT_IO([contin])
sɨxɨx		*!	
sɨkɨx	*!		
☞ sɨkɨk			*

The derivational model encounters the same problems with these cases 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 continuant, the dissimilated [k] is realized throughout, as the analysis predicts.

(18) *Nonfrequentative*

Imperative	*Imperfect*	*Perfect*		
nɨk(ɨ)s	yɨ-rək(ɨ)s	nəkəs	'bite'	/rxs/
tɨk(ɨ)s	yɨ-tək(ɨ)s	təkəs	'burn'	/txs/
nɨk(ɨ)f	yɨ-rək(ɨ)f	nəkəf	'quarrel'	/rxf/
fɨka	yɨ-fəka	fəka	'flee'	/fx⁷/

Frequentative

Imperative	*Imperfect*	*Perfect*		
nɨkək(ɨ)s	yɨ-rkək(ɨ)s	nɨkəkəs	'bite'	/rxs/
tɨkək(ɨ)s	yɨ-tkək(ɨ)s	tɨkəkəs	'burn'	/txs/
tə-rkakəf	yɨ-tɨ-rkakəf	tə-rkakəf	'quarrel'	/rxf/
a-fkaka	y-a-fkaka	a-fkaka	'vanish'	/fx⁷/

More interesting are verbs in which the second radical is /x/ but the third is not a continuant.

(19) *Nonfrequentative*

Imperative	*Imperfect*	*Perfect*		
sɨxər	yɨ-sxər	səkər	'get drunk'	/sxr/
mɨxɨr	yɨ-məxɨr	məkər	'advise'	/mxr/
nɨxəβ	yɨ-rəxɨβ	nəkəβ	'find'	/rxβ/

Frequentative

Imperative	*Imperfect*	*Perfect*		
tə-sxaxər	yɨ-t-sɨkakər	tə-skakər	'act naughtily'	/sxr/
tə-mxaxər	yɨ-tɨ-mkakər	tə-mkakər	'advise each other'	/mxr/
tə-rxəxəβ	yɨ-tɨ-rkəkəβ	tə-rkəkəβ	'show up'	/rxβ/

Reduplication of the middle radical creates a /x/ + /x/ sequence; the first /x/ should dissimilate to [k] and by IDENT_BR we expect the second one to follow suit and surface as [k] as well. The imperfect and perfect forms are consistent with this prediction but the imperative is not: here both the base and the reduplicant remain as fricatives.

We understand this behavior as follows. Unlike the /12/ → 1212 and /12/ → 122 patterns discussed earlier, /123/ → 1223 reduplication is ''morphological'' in the sense that the reduplicated form is morphologically related to an independently occurring base form. The problem is thus

to explain why in the frequentative imperative *tə-sxaxər* 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 *s xər.* We state this constraint in (20). See Benua 1995, Burzio 1996, Kenstowicz 1997, Itô and Mester 1997, and Steriade 1997 for discussion and additional examples of such output-output constraints.

(20) IDENT$_{OO}$([contin])
A radical consonant in the frequentative has the same value for [continuant] as its correspondent in the nonfrequentative.

The tableau in (21) illustrates our analysis for the frequentative imperative *tə-sxaxər.* Following Banksira (1997), we assume that the C is the reduplicant (based on its fixed *a*-vocalism) and the following consonant is the base (whose vocalism varies according to the aspect of the verb; the obligatory *tə-* prefix is omitted for simplicity).

(21)

/sxr, cCacəc/	IDENT$_{BR}$([contin])	IDENT$_{OO}$([contin])	*[x] . . . [+contin]
☞ sxaxər			*
skaxər	*!		
skakər		*!	
sxakər	*!	*	

IDENT$_{BR}$ for [continuant] rules out mixed forms *skaxər* and *sxakər* in which the base and reduplicant do not match. IDENT$_{OO}$, requiring the radicals of the frequentative to match in [continuant] the corresponding radicals of the morphologically basic nonfrequentative form *s xər,* excludes the candidate *skakər* with a stop, leaving *sxaxər* as the only viable alternative candidate. It violates *[x] . . . [+contin]; but since IDENT$_{OO}$([contin]) ranks higher, the dissimilated *skakər* competitor has been eliminated. These data also tell us that IDENT$_{BR}$([contin]) must outrank *[x] . . . [+contin]. Otherwise, *skaxər* would be the winner.

Given that IDENT$_{OO}$([contin]) 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 and Banksira 1996), there is no independently occurring output form that could block dissimilation for these formations. Dissimilation thus applies freely.

Finally, we must explain why IDENT$_{OO}$([contin]) does not block a stop in the imperfect forms: compare frequentative *y   -t-s kakər* with nonfrequentative *y   -səx r.* The answer is that the template for the imperfect of the derived frequentative verbs requires the penultimate radical to be a geminate (which surfaces as a stop if nonstrident (Banksira 1997): compare nonfrequentative *y   -səβ r* with frequentative *y   -sβəp   r* 'break'). This templatic requirement CC$_i$VG$_i$VC (G = gemi-

nate) thus dominates the output-output constraint matching for [continuant] and introduces a discrepancy between the frequentative and nonfrequentative forms.[1]

(22)

/sxr, cCaccəc/	Template	IDENT$_{BR}$([contin])	IDENT$_{OO}$([contin])
sxaxər	*!		
skaxər	*!	*	
☞ skakər			*
sxakər		*!	

The Hasse diagram in (23) reviews the crucial constraint rankings of the proposed analysis.

(23)
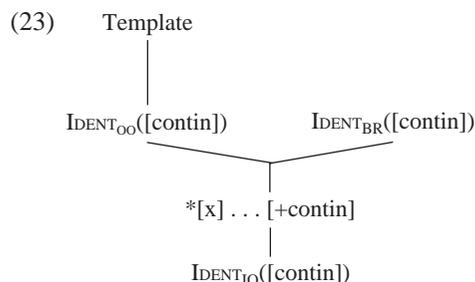
4 Conclusion

In this article 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 IDENT$_{BR}$ for [continuant] above the input-output faithfulness constraint for [continuant] and thus is an analytic option predicted by the Optimality Theory model in terms of its basic formalism of constraint ranking. As observed 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 is unable to describe this phenomenon adequately. Finally, we noted some cases where the expected dissimilation is blocked in the /123/ → 1223 pattern forming frequentative verbs. These were argued to reflect an output-output constraint

[1] [β] and [p] differ not in being [±continuant] but in being [±sonorant] (see Banksira 1997). Hence, IDENT$_{BR}$([contin]) does not apply in *y̆-sβəp̆r* 'break'.

requiring the radicals to match the corresponding base forms in the feature [continuant]. This output-output effect is itself overridden by templatic requirements that force a stop in the face of a corresponding continuant in the nonfrequentative verb.

Although 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—approximately 100 roots containing /x/. Although 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 and Prince (1995) but is puzzling in the rule-based derivational model of traditional generative phonology.

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