FEATURAL MOBILITY AND PHONOLOGY-MORPHOLOGY INTERFACE IN CHAHA*

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1. Introduction

Chaha, one of the Semitic languages of Ethiopia, is known to have floating affixes, which appear as labialization and/or palatalization on consonants. In this paper, I will propose that such affixes are not floating in the underlying representation and that floating is phonology driven.

1.1. Labializable and palatalizable consonants and their triggers

(1)	a. Labialization		b. Palatalization	
	labials	velars	alveolars	velars
Ejectives		k' → k'^{w}	t' → č'	k' → c'
Vl stops	p → p^{w}	k → k^{w}	t → č	k → c
Vd stops	b → b^{w}	g → g^{w}	d → ǰ	g → ɟ
Vl fricatives	f → f^{w}	x → x^{w}	s → š	x → ç
Vd fricatives			z → ž	
Nasals	m → m^{w}		n → n	
Approximants	β → w		r → j	
	w-triggered		{w, j}-triggered	*j*-triggered

Labialization is *w*-triggered; it adds rounding to its targets (labials and velars). Alveolar Palatalization requires retraction and raising, processes induced by the features [+back, +high] of /w/ or [-back, +high] of /j/. They are *j*- or *w*-triggered. Velar Palatalization requires fronting; this can be induced only by the feature [-back] of front vowels and the glide /j/. In Chaha, it is *j*-triggered.

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1.2. 3m. sg. object labialization

The respective last, medial and initial radicals are labialized in (2a, b, c) as an expression of the 3m. sg. accusative object. Labialization fails to apply in (2d). The suffixal /m/ is never labialized even though a final radical /m/ can be labialized as in *ətəm*^{w} 'sister'.

(2) Labializable consonants in the verb but not in the subject and case suffixes

a.	bətəx^{w}	- ə - n - ɬ - m	'he uprooted him/it'
b.	gəf^{w}ər	- ə - n - ɬ - m	'he released him/it'
c.	k'^{w}ət'ər	- ə - n - ɬ - m	'he killed him/it'
d.	sədəd	- ə - n - ɬ - m	'he chased him/it'

The subject suffix *-ə* in (2) does not include a labializable consonant, in which case the rightmost labializable radical is labialized. On the other hand, when the subject suffix includes a labializable consonant, such as /x/ in (3), the radicals are not labialized; instead, labialization falls on /x/.

(3) Labializable consonants in the verb and its subject but not in the case suffix

a.	bətəx -	x^{w}ə - r - ə - m	'you (m. sg.) uprooted for him'
b.	gəfər -	x^{w}ə - r - ə - m	'you (m. sg.) released for him'
c.	k'ət'ər -	x^{w}ə - r - ə - m	'you (m. sg.) killed for him'
d.	sədəd -	x^{w}ə - r - ə - m	'you (m. sg.) chased for him'

In (4), the case suffix is labializable in which case neither the labialized radicals of (2) nor the subject consonant /x/ of (3) are labialized; labialization surfaces on the case suffix /ß/, instead. When labialized, /ß/ surfaces as [w] (i.e. /ßw/ → *β*^{w} → [w]).

(4) Labializable consonants in the verb as well as in subject and case suffixes

a.	bətəx -	xə - ß^{w} - ə - m	'you (m. sg.) uprooted in detriment of him'
b.	gəfər -	xə - ß^{w} - ə - m	'you (m. sg.) uprooted in detriment of him'
c.	k'ət'ər -	xə - ß^{w} - ə - m	'you (m. sg.) uprooted in detriment of him'
d.	sədəd -	xə - ß^{w} - ə - m	'you (m. sg.) uprooted in detriment of him'

The labialized radicals and suffixal /x/ of (2)-(3) are not labialized in (4); instead, labialization surfaces on the suffix /ß/, but *β*^{w} always surfaces as [w].

2. Proposal

This so-called mobile 3m. sg. object has a fixed linear order – underlined in (5).

(5) Linear order of verbal constituents (in the Perfective) [1]

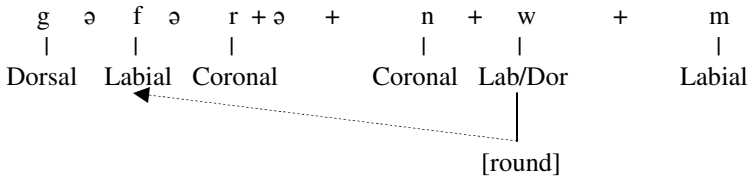
Verb + Subject (+ Case + **Object**) + Tense

It satisfies Subcategorization frames and selection restrictions at this level.

2.1. Rules-based analysis

The 3m. sg. object is /-w/; its feature [round] spreads to the nearest preceding target (labial or velar), resulting in Rightmost Labialization. Then, [round] delinks from its original position, as shown in (6).

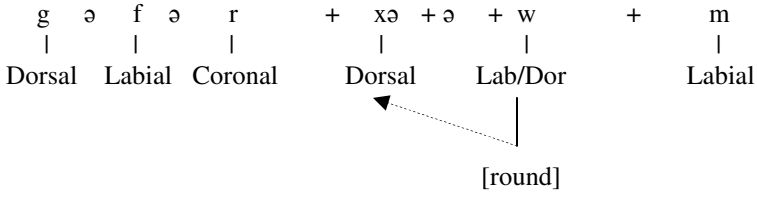
(6) Spreading and Delinking:



/gəfər-ə-n-w-m/ → [gəf^{w}ərənɨm] 'he released him/it'

The fact that /w/ is a labio-dorsal explains why it spreads to either a labial or a dorsal, and not a coronal. Spreading is leftward; this explains why the final /m/ is never targeted. There is no labializable suffix consonant between the radicals and /w/ in (6), hence the rightmost labializable radical /f/ is labialized. The initial radical /g/ is not the rightmost target, /f/ is, so it is not labialized.

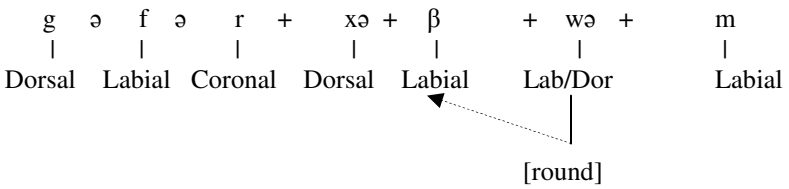
(7) Labialization target in the subject suffix, radicals are no longer rightmost



/gəfər-xə-r-wə-m/ → [gəfərx^{w}ərəm] 'you (m. sg.) released for him'

[1] Verb, Subject and Tense are obligatory constituents but the exponents of the last two may be null. *T*-converb and Tense, *M* converb and MVM are in complementary distribution. Given that Tense, *M* converb and MVM are final and complementary, it is impossible to establish a linear order between the three, and the distinction among them is not always clear-cut. Case expresses the grammatical status of the following object (see §4.1 and Banksira 2000 261ff. for details). Case and Object are concomitant and they appear only when the object is definite.

(8) Labialization target in the case suffix, neither radicals nor *-x* are rightmost



/gəfər-xə-β-wə-m/ → [gəfərxəwəm] 'you (m. sg.) released in detriment of him'

Given four constituents (namely: 1 = verb, 2 = subject, 3 = case, and 4 = m) with established linear precedence {1 < 2 < 3 < 4}; [round] always precedes 4; [round] cannot precede 3 unless 3 is not a permissible host; [round] cannot precede 2 unless 2 and 3 are not permissible hosts; [round] never precedes 1. These prove that [round], or the proposed /w/, has a fixed linear order in UR; it follows 3 and it precedes 4.

2.2. Constraints-based analysis

Constraints on correspondence (from McCarthy and Prince, 1995)

(9) MAX:

Every segment in S1 has a correspondent in S2 (No deletion).

According to this definition, MAX is violated only when /w/ (= S1) does not manifest itself in the form of labialization or palatalization.

(10) LINEARITY: S1 is consistent with the precedence structure of S2, and vice versa ('No Metathesis', assigns one violation mark for each underlying segment intervening between /-w/ and its spreading target.)

Other constraints required to account for the data

(11) *SPREAD RIGHT: Do not spread rightward. ('Spreading is leftward')

(12) *COR/LAB: Coronals cannot be labialized.
(13) *GLIDE: Glides are not allowed.
(14) ONSET: Syllables must have onset.

Constraint ranking: *SPREAD RIGHT, *COR / LAB, *GLIDE >> MAX

(14)	/sədəd + ə + n + w + m/	*SPREAD RIGHT	*COR / LAB	*GLIDE	MAX
	a. sədəd-ə-n-i̟-m^{w}	*!			
	b. sədəd-ə-n^{w}-i̟-m		*!		
	c. sədəd-ə-n-w-m			*!	
☞	d. sədəd-ə-n-i̟-m				*

*SPREAD RIGHT, *COR/LAB and *GLIDE are high-ranked and they are never violated, so they eliminate candidates (14a-c), making (14d) optimal.[2]
In (15), violations of *GLIDE and MAX are avoided by violating LINEARITY, but violation is minimal. LINEARITY is taken to be categorical, as defined in McCarthy (2003: 1007).

*GLIDE >> MAX >> LINEARITY

(15)	/gəfər + xə + n + w + m/	*GLIDE	MAX	LINEARITY
	a. gəfər-xə-n-w-m	*!		
	b. gəfər-xə-n-i̟-m		*!	
☞	c. gəfər-x^{w}ə-n-i̟-m			**
	d. gəf^{w}ər-xə-n-i̟-m			*****!
	e. g^{w}əfər-xə-n-i̟-m			*******!

Candidate (15c) is preferred over candidates (15d, e) because it incurs less number of LINEARITY violations.

Candidates with more than one rounded consonant (e.g. **g^{w}əf^{w}ər-x^{w}ə-n-i̟-m*) are eliminated for multiple violations of LINEARITY without being enforced by preservation or assimilation requirements.

Candidate (16a) is eliminated by **ß^{w}* and (16b, c) by MAX violation. The optimal (16d) preserves both /ß/ and /w/ (it represents both) without violating *GLIDE.

*ß^{w}, MAX >> *GLIDE >> LINEARITY

(16)	/gəfər-xə-ß-Uə-m/	*ß^{w}	*GLIDE	MAX	LINEARITY
	a. gəfər-xə-ß^{w}-ə-m	*!			
	b. gəfər-x^{w}ə- -ə-m			*!	**
	c. gəfər-xə-ß-ə-m			*!	
☞	d. gəfər-xə-w-ə-m				

[2] [i̟] is epenthetic, which is inserted by violating a low-ranked DEP not to have **sədəd-ə-n-m*. Similarly, /w/ does not change to [u] because *w*-deletion is preferred over *w*-vocalization. The constraints related to these and the candidates eliminated by them (not shown) are not deterministic.

The displacement of /w/ is now accounted for without alignment constraints.
In all the contexts discussed so far, /w/ is post-consonantal. We shall now look at cases in which /w/ is post-vocalic, where we find empirical evidence for the proposed /w/ and its linear order. The context for this is found in the impersonal subject suffix.

3. Impersonal

3.1. Impersonal Labialization and Palatalization

When the stem is consonant-final, as in (17), the impersonal subject is expressed by Rightmost Labialization, (17a), or by Final Palatalization, (17b). The two processes may apply in conjunction, (17c), or both may fail to apply, (17d).

(17)	Impersonal I	Impersonal II	Personal	
a.	nɨfk'^{w}-i	nɨfk'^{w}-ɨ-m	nɨfk'	'Let one yank!'
	bɨx^{w}ər-i	bɨx^{w}ər-ɨ-m	bɨxər	'Let one lack sth!'
	b^{w}arɨr-i	b^{w}arɨr-ɨ-m	barɨr	'Let one demolish!'
b.	t'ɨrš-i	t'ɨrš-ɨ-m	t'ɨrs	'Let one break off a piece!'
c.	kɨf^{w}č-i	kɨf^{w}č-ɨ-m	kɨft	'Let one open!'
	g^{w}ɨrəž-i	g^{w}ɨrəž-ɨ-m	gɨrəz	'Let one age!'
d.	nɨt'r-i	nɨt'r-ɨ-m	nɨt'ɨr	'Let one wean!'

(18) Four impersonal allomorphs observed in (17)

a.	^{w}	(from (17a))
b.	^{j}	(from (17b))
c.	^{w}(…)^{j}	(from (17c))
d.	ø	(from (17d))

We propose that the impersonal suffix is /w/, similar with the 3m. sg. object. The four allomorphs derive by Decomposition of /w/, in which the features [round] and [+high] of /w/ spread to different targets and then delink.

(19) Decomposition of /w/

C	C	+	w	
Dorsal/Labial	Coronal$_{[-son]}$		Dorsal	Labial

[+high] [round]

Decomposition of /w/ accounts for the simultaneity of the two processes.

3.2 Impersonal *-w* and *ə*-Rounding

In the forms shown in (20), the suffix /-jtə/ (of *t* converb) intervenes between radicals and the impersonal /w/. Here, in contrast with the impersonal allomorphs shown in (18), the impersonal surfaces as *-w* (first column) or *ə* Rounding (second column).

(20)	Impersonal I	Impersonal II	Personal	
a.	nɨfc'-ɨtə-w-i	nɨfc'-ɨt-o	nɨfc'-ɨtə	'having yanked'
	bɨxe - tə-w-i	bɨxe-t-o	bɨxe-tə	'having lacked sth'
	bari-tə-w-i	bari-t-o	bari-tə	'having demolished'
b.	t'ɨrš-ɨtə-w-i	t'ɨrš-ɨt-o	t'ɨrš-ɨtə	'having broken off'
c.	nɨk'č'-ɨtə-w-i	nɨk'č'-ɨt-o	nɨk'č'-ɨtə	'having kicked'
	gɨrəš-tə-w-i	gɨrəš-t-o	gɨrəš-tə	'having aged'
d.	nɨt'i-tə-w-i	nɨt'i-t-o	nɨt'i-tə	'having weaned'

The difference between Impersonal I and Impersonal II is that /w/ is intervocalic in the former while it is post-vocalic in the latter.

Impersonal *w* and *ə* Rounding obtain also when no other suffix intervenes between the stem and the impersonal suffix, as shown in (21).

(21) zɨrəkə-w-i-m zɨrək-o-m (< zɨrəkə-w-m) 'one spoke'

These examples reveal that the *t*-converb is not responsible for *w* and *ə*-Rounding and they provide us with empirical prove that mobility of /w/ is phonologically conditioned.

(22) Different realizations of /w/ (where V = vowel and C = consonant)

a.	/VwV/ →	[VwV]	(/w/ is unaffected)
b.	/Vw{C,#}/ →	$V_{[+round]}$	(/w/ coalesces with a left-adjacent vowel)
c.	/Cw/ →	$C_{[+round]}$ ($C_{[+pal]}$)	(/w/ coalesces with preceding consonants)

These rules have nothing to do with the fact that /w/ in our examples is the exponent of the 3m. sg. object or the Impersonal subject. They apply to /w, j/ irrespective of the meanings associated with them (/j/ is not presented but it pattern exactly like /w/).

To account for V-w coalescence, (22b), we need one more constraint, given in (23).

(23) *Vw{C,#}

The constraint ONSET dominates *GLIDE, which dominates UNIFORMITY. This explains why glides coalesce when not required to be the onset.

(24)	/nɨfk'-jtə-w-i/	ONSET	*GLIDE	UNIFORMITY
	a. nɨfk'-ɨjtə-w-i		**!	
☞	b. nɨfc'-ɨtə-w-i		*	*
	c. nɨfc'-ɨt-o-i	*!		**

4. Conclusions

Chaha affixes with floating features have linear order and hierarchical structure in UR. Given that floating features can be a morpheme or part of a morpheme and that these features can be contained with in one morpheme the floating nature of phonological features cannot be attributed to particular morphemes. Simultaneous labialization and palatalization are triggered by features of /w/. The leftward direction of spreading explains why targets to the right of a trigger are not affected.

References

Akinlabi, Akinbiyi. 1996. Featural affixation. *J. Linguistics* 32, 239-289.

Banksira, Degif Petros. 2000. *Sound Mutations: The Morphophonology of Chaha*. Amsterdam and Philadelphia: John Benjamins.

Hetzron, Robert. 1971. Internal labialization in the tt-Group of Outer South-Ethiopic. *Journal of the American Oriental Society* 91, 192-207.

McCarthy, John. 1983. Consonantal morphology in the Chaha verb. *In The Proceedings of the West coast conference on formal linguistics II,* ed. by M. Balow, D. Flickinger and M. Wescoat, 176-188. Palo Alto: Stanford Linguis tics Association.

McCarthy, John and Alan Prince. 1995. Faithfulness and reduplicative identity. *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, ed. by J. Beckman, L. Walsh Dickey and S. Urbanczyk. 249-384. Amherst: GLSA.

McCarthy, John. 2010. An introduction to harmonic serialism. *Language and Linguistic Compass* 4, 1001-1018.

Piggott, Glyne. 2000. Against featural alignment. *J. Linguistics* 36, 85–129.

Rose, Sharon. 1997. *Theoretical issues in comparative Ethio-Semitic phonology and morphology.* Ph.D. dissertation, McGill University.