

## **Labial dissimilation as an Amazigh substratum in Moroccan Arabic\***

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### **ملخص**

تروم هذه المقالة التي تعنى بدراسة وتحليل ظاهرة المخالفة المتعلقة بالأصوات الشفوية والمستديرة في العربية المغربية تقديم أدلة مفادها أن هذه الظاهرة الصوتية لا يمكنها أن تعالج إلا بالرجوع إلى الأمازيغية المغربية. ونتبنى في دراستنا المنجزة في إطار نظرية الأمثلية (Optimality Theory) الفرضية التي تفيد بوجود حقينة أمازيغية (Amazigh Substratum) في العربية المغربية ناتجة عن الإتصال بين اللغتين عبر التاريخ.

الكلمات المفتاح: المخالفة، الأصوات الشفوية والمستديرة، الحقينة الأمازيغية، الإتصال اللغوي، نظرية الأمثلية.

### **Abstract**

The paper is an attempt to provide evidence for the existence of an Amazigh substratum in Moroccan Arabic by considering the way labial and round dissimilatory processes are woven in the language. In particular the paper seeks to explain within the constraint-based framework of Parallel Optimality Theory that labial/round dissimilation is a contact-induced phenomenon resulting from the influence of Moroccan Amazigh and as such prior knowledge of this language seems to be a prerequisite for a thorough understanding of the dissimilation process in Moroccan Arabic.

Keywords: Labial/round dissimilation, contact, Moroccan Arabic, Amazigh substratum, Optimality Theory

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\* I would like to thank the editors of this issue of the *International Journal of Arabic Linguistics* for having accepted to publish this paper. The content in this paper is based essentially on initial proposals made in chapter 6 of Boudlal (2001), some of which were developed in Bensoukas and Boudlal (2012). The paper has benefited a great deal from comments made by Karim Bensoukas, some of which I was unable to include due to time constraints. It has also benefited from comments by Abdellatif Al Ghadi, Mohamed Marouane, Samira Rguibi, Said Bennis and Assia Laaboudi and has improved tremendously thanks to comments from two anonymous reviewers. As the disclaimer goes, all left errors are entirely my responsibility.

## **0. Introduction**

The mutual interinfluence between Moroccan Arabic and Moroccan Amazigh (henceforth MA and MAm) over the history of their coexistence as well as their interaction with other languages used in Morocco has resulted in contact-induced phenomena relating to different aspects such as phonology, morphology, syntax and the lexicon. These phenomena contributed to the development and change in each of the two languages to the extent that a number of linguists such as Elmedlaoui (1992/1995, 1998, 2000), Chafik (1999), Durand (1998) and Bensoukas and Boudlal (2012) claim that dealing with some of the intricate contact-induced changes in one language cannot claim to be adequate without considering the other language. However, the large body of literature on the contact between the two languages disagrees on the question of whether the incurred change resulting from this contact is proof of the existence in the grammar of what Kossmann (2013) refers to as adstratum, superstratum or substratum.

A number of works have considered the commonalities between MA and MAm and reiterated the idea that the two languages have a lot in common. Kossmann (2013) maintains that the affinities between the two languages are due to parallel development and not to the existence of a superstratum or a substratum. An opposing view is held by Durand (1998) who claims there is an Amazigh substratum in the grammar of MA and presents evidence from his analysis of the vocalic systems and some aspects of the prosody of both MA and MAm. The most recent work on the two languages undertaken by Bensoukas and Boudlal (2012a, 2012b) ascertains that understanding certain aspects of the phonology of MA requires recourse to Amazigh. In this respect, the authors, who have done extensive comparative work on the behavior of schwa in both MA and MAm, concluded that the two languages have the same overall prosodic behavior as far as schwa is concerned and explained it by resulting from the presence of an Amazigh substratum in the grammar of North African Arabic much like other studies such as Elmoujahid (1995), Chtatou (1997), Elmedlaoui (1992/1995, 1998, 2000), Chafik (1999), Tilmatine (1999), Dell and Elmedlaoui (2002), Lafkioui (2013), Boudlal (2017), Bensoukas (in this volume), to cite but a few.

The present paper seeks to provide further evidence for the existence of an Amazigh substratum in MA by considering the labial dissimilation process which affects both dorsal and labial consonants. Labial here is used as a cover term to refer to both the features [labial] and [round]. Dissimilation of the feature [round] is at stake when the segments involved are labialized

consonants or vocoids, whereas the feature [labial] is called on when the segments involved are the labial consonants [b, f, m] and the labiovelar glide *w*. The analysis is cast within the constraint-based framework of Optimality Theory (OT) (Prince and Smolensky 1993/2004; McCarthy and Prince 1993 and related works).

The rest of the paper is articulated as follows. Section 1 presents the facts and section 2 the theoretical framework proposed for our analysis. Section 3 deals with the main issue dealt with in this paper –Labial dissimilation. The section is a background study on labial/round dissimilation in Tashlhit, an Amazigh variety serving as a springboard for the MA data analysis. Section 4 exposes the dissimilatory cases we assume to evidence the Amazigh substratum hypothesis. Section 5 reanalyzes the cases of labiovelarization and proposes that they also involve dissimilatory cases that have not been reported before. The section also tackles other cases of what might be referred to as cases of round dissimilation that do not seem to lend support to the Amazigh substratum hypothesis. Finally section 6 concludes the paper.

## 1. Presentation of the data

The first piece of evidence supporting the existence of an Amazigh substratum in MA comes from cases of what is referred to in Boudlal (1998, 2001) as lexical labialization. This type of labialization, which serves to indicate lexical contrast, affects the labiovelarized dorsal counterpart sounds of the consonants /k, g, x, ɣ, q/ which seem to appear in all the derived forms of a large number of nouns as the examples in (1) below, from the variety of MA spoken in Casablanca, show.

(1)

<i>Singular</i>	<i>Plural</i>	<i>Diminutive</i>	<i>Gloss</i>
k <sup>w</sup> bala	k <sup>w</sup> balat/k <sup>w</sup> bal	k <sup>w</sup> bijla	mais
g <sup>w</sup> əffa	g <sup>w</sup> əffat/g <sup>w</sup> faf	g <sup>w</sup> fifa	basket
x <sup>w</sup> zana	x <sup>w</sup> zanat/x <sup>w</sup> zajən	x <sup>w</sup> zijna	tent
ɣ <sup>w</sup> ta	ɣ <sup>w</sup> tawat/ɣ <sup>w</sup> ətjan	ɣtiwa	cover
q <sup>w</sup> ənt	q <sup>w</sup> nat	q <sup>w</sup> nijjət	corner

Note here that most of the nouns given have two plurals; a sound and a broken plural and that the initial dorsal is labialized in both forms. Boudlal (1998) who assumes that the labialization of the dorsal consonants in (1) is attributed to the influence of Tashlhit Berber (TB)

posits that such a labialization is characteristic of to what he refers to as southern varieties of MA as opposed to northern varieties. The difference between the two groups reflects the way each group behaves with respect to labialization. Southern varieties of MA labialize; northern do not. Such a stand is also the view held by other scholars such Elmedlaoui (1992/1995), Aguade and El Yaacoubi (1994) and Caubet (2006). We might also cautiously say that the difference also holds for the Amazigh varieties in which labial consonants do not appear in the northern varieties of Moroccan Amazigh as opposed to southern varieties (Bensoukas 2014).

The distinction ‘northern’ as opposed to ‘southern’ brings to the surface the nature of the relationship between TB and the variety of MA spoken in Casablanca, two different dialects separated geographically. Assuming lexical labialization in MA to be the result of the influence of TB requires that the two varieties be in immediate contact and therefore geographically near each other. However, this is not the case as the first, TB, is spoken in the Sous Valley, whereas the second, Casablanca MA, is spoken in the Shawiyya Plains. So, where does the contact responsible for this influence come from?

The first piece of evidence for the contact comes from the migration phenomenon. Moumine (1990) reports that as a result of the migration of the rural speakers of the neighboring areas to Casablanca as well as migrants from other regions of the country, especially Berber-speaking areas, Casablanca has become a melting pot of different rural and urban dialects, a situation that has undoubtedly caused contact and interinfluence among different dialects. The contact that has taken place caused dialect mixture and gave rise to new dialectal forms. Since Casablanca is the economic capital of Morocco, it’s quite normal that it attracts people looking for employment and people who would like to set up businesses. Among the migrants who settled in Casablanca and dominated commerce and trade in the 20<sup>th</sup> century were Amazigh speakers from the Souss Valley who brought with them their language and had definitely an impact on the variety of MA spoken in the city, hence the interinfluence between TB and Casablanca MA.

The other piece of evidence rests on an assumption that has a background in the history of Morocco and whose effects are observed synchronically. It might be the case that prior to their Arabization by Banu Hilal in the eighth century, the tribes in the Shawiyya, Doukkala, Abda and neighboring plains probably spoke southern Amazigh dialects that had labial consonants and that showed labial dissimilation in their morpho-phonology. It was inevitable that after their

Arabization, the tribes retained Amazigh traces in the varieties of MA spoken today and referred to as southern varieties of MA, to which Casablancese Arabic belongs.

The second set of data that will be considered in this paper and which we think finds support in the Amazigh substratum hypothesis concerned with is referred to as labial/round dissimilation. The data in (2) illustrate the phenomena. The diminutive in MA is formed by affixation of the morpheme *i* and the feature [round] (Lasri, 1989; Al Ghadi 1990/2014; Elmedlaoui 1992/1995, 1998); Boudlal, 2001). The affix *i* is placed after the second consonant of the base noun, whereas the feature [round] docks on the first labializable consonant before the affix; i.e. a dorsal consonant (2a) or a labial consonant (as will be seen in section 5 below). When the word consists of one major syllable as is the case with the items in (2) below, the diminutive form is augmented by the addition of a default schwa syllable to satisfy the constraint requiring that the output be disyllabic (Al Ghadi 1990/2014):

(2)

<b>Noun</b>	<b>Diminutive noun</b>	<b>Gloss</b>
kbir	k <sup>w</sup> bijjər / kbibər	big
glil	g <sup>w</sup> lijjəl / gliwwəl	short
ɣir	ɣ <sup>w</sup> ijjər / ɣiwwər	small
rqi	r <sup>w</sup> ijjəq / rqiwwəq	thin
qɣir	q <sup>w</sup> ijjər / qɣiwwər	short
xɣif	x <sup>w</sup> fijjəf / -----	light

The output of the diminutive is reminiscent of the Amazigh dissimilatory cases treated in Bensoukas (1999, 2014). This explains why all the items in (2) (except the one meaning ‘light’) have two diminutive forms: one with a labiovelarized dorsal; the other without. The variation in the pronunciation of the diminutive is conditioned by whether or not the word consists of a rounded dorsal consonant. When the dorsal consonant retains its rounding, the default syllable takes the glide *j* instead of *w*. Note here that the free variation in the items in (2) above and in other subsequent cases is reflective of the regional differences among different varieties of MA, a formal account of which is beyond the scope of this paper.

The labial/round dissimilatory process extends to cover loans that have been integrated in MA. These loans show a variation much like that witnessed in (2). Consider the items in (3) below for illustration:

(3)

<i>Singular</i>	<i>Plural</i>	<i>Gloss</i>
ridu	riduwat/ ridujat	curtain
stilu	stiluwat/ stilujat	pen
biru	biruwat/ birujat	desk
tijju	tijjuwat/tijjujat	hose

The use of either of the two output plural forms reflects regional variation in pronunciation. The words on the left-hand columns seem to be characteristic items of the southern varieties of MA, while those on the right-hand column seem to be used in the northern varieties of MA. What interests us here more is the fact that when the plural affix *-at* is added to vowel final bases, a glide, which agrees in backness and rounding, is epenthesized to serve as an onset to that affix. That's exactly the case of the items on the left-hand column. The alternate pronunciation of the plural dissimilates the glide *w* to *j* to avoid aligning two rounded segments, a process we assume derives from avoiding the repetition of the feature [round] (Bensoukas 1999, 2014).

## 2. Theoretical Framework

The analysis we propose for labial/round dissimilation is undertaken within the OT framework as proposed in Prince and Smolensky (1993/2004), McCarthy and Prince (1993) and other related works. The assumption underlying OT, or parallel OT as McCarthy prefers to call it,<sup>1</sup> is that the relation between the input and output is governed by the interaction of potentially violable universal constraints on output well-formedness. The OT apparatus consists of GEN, a generator of output candidates from phonological representation, EVAL, which evaluates the well-formedness of these candidates to decide which one is optimal, and finally CON, referring to a set of universal constraints ranked on a language-particular basis. The optimal candidate is the one that minimally violates the set of constraints constituting CON.

In OT constraints are of two types: markedness and faithfulness constraints. Markedness constraints enforce the well-formedness of the output forms. They prohibit structural changes

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<sup>1</sup> McCarthy (2016) states that GEN in parallel OT can make many changes at once when it produces a candidate. This means that competing candidates can differ in many ways from each other and from the underlying representation. This view has been abandoned in Harmonic Serialism, another version of OT, in which GEN is limited to making just one change at a time, a sort of step-by-step derivation.

affecting the input. Faithfulness constraints enforce similarity between the input and the output. For example they militate against deletion or insertion that affects the input or the base. The interaction of both types of constraints is what decides about their ranking and subsequently the selection of optimal candidates.

To illustrate how the OT system works, consider the constraint tableau below, where CON consists of three constraints: Con1, Con2 and Con3:

(4)

Candidates	Con1	Con2	Con3
☞ a. Cand 1		*	*
b. Cand 2	*!		

The optimal candidate (i.e. Cand 1) is marked by ☞. Violations are marked by an asterisk [\*] and a fatal violation is marked by [!]. Con1 dominates Con2 and Con3 (written as **Con1>>Con2, Con3**, represented in the tableau by a solid line separating the constraints. When no domination relationship holds between two constraints, they are written as **Con2, Con3** and are separated by a dotted line in the constraint tableau. The optimal candidate in this tableau is Cand 1 which violates low ranked constraints, namely Con2 and Con3.

Developments within the OT framework were very important to the Emergence of Correspondence Theory (CT) (McCarthy and Prince 1995, 1999), which extends the reduplicative copying to other domains where identity relations are imposed on pairs of related representations. McCarthy and Prince propose a set of family constraints, such as the MAX family of constraints militating against deletion, the DEP family of constraints prohibiting insertion and the IDENT family of constraints requiring correspondence between the input and the output. (For a comprehensive view of the theory, the reader is referred to Kager, 1999).

The analysis proposed in this paper is OT-based and assumes that labial/round dissimilation derives from locally conjoining two constraints (Alderete 1997, Ito and Mester 1998, 2003; Fukazawa, 1999 among others). It obviates the need to make recourse to OCP (McCarthy, 1986) whose effect is seen to derive from the interaction of constraints militating against the repetition of marked structure within a specific domain. Accounting for dissimilation using locally conjoined constraints was first proposed for MA in Imouzaz (2002) and for TB in

Bensoukas (1999, 2006, 2014). The essence of the idea brought in in these two references is maintained in this paper.

### 3. Labial and round dissimilation in MAm

This section will consider the cases of labial/round relations assumed to be the main focus in this paper. Our departing hypothesis is that the dissimilatory cases in MA are evidence of the existence of an Amazigh substratum and as such no analysis can claim to be explanatorily adequate without reference to how that process works in MAm.

To understand how labial dissimilation works in MA, we first consider how it is woven in one of the varieties of MAm –TB as described in Bensoukas (1999, 2006, 2014). However and before doing that, background knowledge about the inventory of the labiovelar sounds in TB is in order.

#### 3.1 Inventory of labiovelar consonants

The consonantal inventory of TB consists of 35 consonant phonemes which we give in (5) below.

(5) Tashlhit consonantal system, after Bensoukas (2014, p. 14):

	Labials	Coronals	Dorsals	Gutturals
Stops	<b>b</b>	t, d, ṭ, ḍ,	k, g, k <sup>w</sup> , g <sup>w</sup>	q, q <sup>w</sup>
Fricatives	<b>f</b>	s, z, ṣ, ẓ ʃ, ʒ, š, ž	x, ɣ, x <sup>w</sup> , ɣ <sup>w</sup>	ħ, ʕ, ʕ̣
Sonorants	<b>m</b>	n, l, r, ḷ, ṛ		
Glides	<b>w</b>	J		

The relevant sounds in this paper are the labials /b, f, m/, and the rounded consonants /k<sup>w</sup>, g<sup>w</sup>, x<sup>w</sup>, ɣ<sup>w</sup>, q<sup>w</sup>/. Based on the minimal pair test, Bensoukas (2014) (see also Elmedlaoui (1985)) has shown that TB has all the five labiovelars /k<sup>w</sup>, g<sup>w</sup>, x<sup>w</sup>, ɣ<sup>w</sup>, q<sup>w</sup>/ as independent phonemes.

The basic claim about the five labiovelar consonants is that labial/round dissimilation in TB is the result of interaction of faithfulness and markedness constraints. Translated in terms of inventory theory, Bensoukas (1999, 2006, 2014) argues that this interaction basically stipulates that faithfulness constraints dominate markedness constraints: Faithfulness >> Markedness.



Under this ranking and in the absence of a constraint forcing the alteration of any of the five consonants /k, g, x, ɣ, q/, a round velar or uvular consonant remains faithful to its underlying specification while an unround velar or uvular consonant never gains rounding features (Bensoukas 2006). Given that the rounded counterpart consonants of /k, g, x, ɣ, q/ lose their secondary labiality as will be seen shortly, it follows that dissimilation applies to avoid the repetition of the feature [round].

### 3.2 How dissimilation works in Moroccan Amazigh

The analysis presented in this subsection is essentially drawn from the seminal work undertaken by Bensoukas (2014), which is, to my knowledge, a comprehensive study of labial and round relations in MAm, and more particularly on the variety of TB.

The literature on TB distinguishes two different but related cases of dissimilation: the agentive morpheme labial dissimilation (6a); and the rounded consonant dissimilation (6b):

(6) a. Dissimilation of labial consonants (Bensoukas 2014, p. 20)

<i>UR</i>	<i>Agentive Noun</i>	<i>Gloss</i>
a+m+mgr	anmgar	harvest
a+m+g <sup>w</sup> mr	ang <sup>w</sup> mar	hunt
a+m+dfr	andfur	follow
a+m+ɣdb	anɣdab	injure

b. Dissimilation of round consonants (Bensoukas 2014, p. 21)

<i>UR</i>	<i>Reciprocal</i>	<i>Gloss</i>
m+fts	nfattas	chop
m+ħubbu	nħubbu	love
m+sllm	nsallam	greet
m+xlf	nxalaf	change

Labial dissimilation in Amazigh affects both the agentive noun and reciprocal morpheme *m* in (6a) and (6b), forcing the morpheme to surface as *n* whenever the verbal base to which the morpheme *m* is attached contains one of the primary labial consonants *m, f, b*. Bensoukas (1999, 2014) has shown that TB bans a sequence of labials within the stem and demonstrated that whenever the resulting form would lead to a stem with two primary labials consonants (Selkirk 1993), the first of the two labials delabializes and surfaces as coronal as the data above show.

Bensoukas (1999, 2014) also shows another dissimilatory process, affecting this time non-primary labials, whereby round velar consonants co-occurring with round vocoids dissimilate as shown by the data in (7) below:

(7) Bensoukas (2014, pp. 96, 98)

a.	<b>UR</b>	<b>Aorist</b>	<b>Perfective</b>	<b>Gloss</b>
	/k <sup>w</sup> nu/	knu	k <sup>w</sup> ni/a	bend
	/g <sup>w</sup> nu/	gnu	g <sup>w</sup> ni/a	sew
	/x <sup>w</sup> lu/	xlu	x <sup>w</sup> li/a	become crazy
	/ak <sup>w</sup> r/	ak <sup>w</sup> r	ukr	steal
	/ag <sup>w</sup> r/	ag <sup>w</sup> r	ugr	be older
b.	<b>UR</b>	<b>Singular</b>	<b>Plural</b>	<b>Gloss</b>
	/tag <sup>w</sup> lut/	taglut	tig <sup>w</sup> la	oar
	/aɣ <sup>w</sup> jjul/	ayjjul	iɣ <sup>w</sup> jjal	donkey
	/ag <sup>w</sup> ru/	agru	ig <sup>w</sup> ra	frog
	/amddakk <sup>w</sup> l/	amddakk <sup>w</sup> l	imddukkal	friend

According to Bensoukas, the language observes the requirement that the same stem never contains two non-primary labial specifications. Again, whenever the two specifications arise, the first labial is deleted.

The core hierarchy driving labial/round dissimilation proposed by Bensoukas (2014, p. 121) for TB is as follows:

(8) \*F<sup>2</sup> Stem >> MAX-Root (F) >> MAX (F)

For Bensoukas, \*F is the markedness constraint standing for either \*Labial (in the case of the items in (6) above) or \*Round (in the case of the items in (7)). To see how the agentive/reciprocal morpheme *m* dissimilates to *n*, consider the tableau below for the different competing candidates from the input /m+mgr/. All the tableaux in this section are taken from Bensoukas (2014):

(9)

/m+mgr/	*PL/Lab <sup>2</sup> Stem	MAX-Rt (Lab)	MAX-Lab
i- a-m-mgar	*!		
ii- a-m-ngar		*!	*
☞ iii- a-n-mgar			*

According to the hierarchy in (8), candidate (9-*i*) does not dissimilate the prefix morpheme and as such incurs a flagrant violation of the constraint on the co-occurrence of two primary labials and is therefore discarded. Candidate (9-*ii*) is also illicit because it resorts to the dissimilation of a root consonant. The optimal candidate in (9-*iii*) dissimilates the prefixal labial at the expense of a lower ranked constraint, namely MAX-Lab.

The constraints in tableau (9) also account for round dissimilation involving labialized dorsals and vocoids in (7) above. The relevant conjoined constraint bans a repetition of two rounded features within the stem, hence \*Rnd<sup>2</sup> Stem. Witness the tableau below illustrating the dissimilation of the labialized k<sup>w</sup>.

(10)

/k <sup>w</sup> nu/	*Rnd <sup>2</sup> Stem	MAX-Rt (Rnd)	*Crnd
i- k <sup>w</sup> ni		*	*!
☞ ii- knu		*	

Preserving the rounding of the consonant at the expense of the rounding of the root vocoid leads to a fatal violation of the constraint against rounded dorsals even if it is low ranking. The only way out to have a correct output is by delabializing the dorsal consonant, something the candidate in (10-*ii*) has resorted to.

Having shown how labial/round relations are accounted for in MAm, let's turn now to MA to see the extent to which labial/round dissimilatory cases are woven à la TB as already stated at the outset of this paper.

#### 4. Round dissimilation in Moroccan Arabic

This section will try to account for dissimilation in MA by considering two types of different data sets: those in which dissimilation applies to shun part of the diminutive morpheme

(i.e. the feature [round]) from surfacing in the output form; and second forms showing alternant variants – one with a delabialized consonant and *w*; the other with a labialized consonant and the glide *j* resulting from dissimilation.

#### 4.1 Inventory of labiovelar consonants

We adhere to the consonant inventory suggested in Boudlal (2001) which stipulates that MA, and particularly the variety described and analyzed in the present work, consists of the following consonant phonemes:

(11)

	Labials	Coronals	Dorsals	Gutturals
Stops	<b>b</b>	t, d, t̪, d̪	k, g, <b>k<sup>w</sup></b> , <b>g<sup>w</sup></b> , q <sup>2</sup> , <b>q<sup>w</sup></b>	
Fricatives	<b>f</b>	s, z, s̪, z̪, ʃ, ʒ	x, ɣ, <b>x<sup>w</sup></b> , <b>ɣ<sup>w</sup></b>	ħ, ʕ, ɦ
Sonorants	<b>m</b>	n, l, r, ɾ		
Glides	<b>w</b>	J		

Of particular relevance to us here is the fact that the inventory consists of labiovelar consonants which Boudlal (2001) refers to as cases of lexical labialization; i.e. labialization that accompanies the word in all its realizations as the items in 1 (see section 1 above) illustrate. Evidence for considering labialized dorsals as independent phonemes comes from doublets where a labialized dorsal stands in opposition to its non-labialized counterpart as the examples in (12) below, taken from Boudlal (2001, pp. 16-17) show:

(12)

a.	<b>3sg.Perfective</b>	<b>2sg.Imperative</b>	<b>Gloss</b>
	xrəʒ	x <sup>w</sup> rəʒ	leave
	tqəb	tq <sup>w</sup> əb	pierce
	gʕəd	g <sup>w</sup> ʕəd	sit down

<sup>2</sup> Note here that in order to allow for a unified treatment of labialized consonants, the uvula *q* is listed among dorsals.

<i>b.</i>	<b><i>Adj. (pl.)</i></b>	<b><i>Gloss</i></b>	<b><i>Verb</i></b>	<b><i>Gloss</i></b>
	k <sup>w</sup> bar	big	kbar	he grew up
	q <sup>w</sup> dam	old	qdam	he/it became old
	rx <sup>w</sup> aş	cheap	rxaş	it became cheap
	ɣ <sup>w</sup> laɖ	fat	ɣlaɖ	he/it became fat
<i>c.</i>	<b><i>Noun</i></b>	<b><i>Gloss</i></b>	<b><i>Adj</i></b>	<b><i>Gloss</i></b>
	k <sup>w</sup> həl	kohl	k <sup>w</sup> həl	black (mas. sg)
	x <sup>w</sup> əɖɾa	vegetables	xəɖɾa	green (fem. sg.)
	g <sup>w</sup> əlsa	site for selling st.	gəlsa	sitting

As seen from these items, the substitution of labialized consonants for the corresponding non-labialized consonants results in a change of meaning, a fact which led Boudlal (2001) to recognize both simple and labialized dorsals as separate phonemes in MA. Elmedlaoui (1992) takes a different position and assumes that labialization in MA has a morphological status since it signals the morphological class of the category word but he never shows why certain forms with dorsal consonants never labialize. (See Boudlal 2001 for more details).

#### 4.2 Dissimilation in MA

We start by looking at the clear-cut cases that seem to lend support to the Amazigh substratum hypothesis and which seem to be carbon copies of the cases of round dissimilation reported in Bensoukas (1999, 2014). Consider the examples below for illustration:

(13)

	<b><i>Noun</i></b>	<b><i>Diminutive</i></b>	<b><i>Gloss</i></b>
a.	kəlb	k <sup>w</sup> lijjəb	dog
	qərd	q <sup>w</sup> rijjəd	monkey
	qəlb	q <sup>w</sup> lijjəb	heart
	ɣərsa	ɣ <sup>w</sup> riɣa	plant
	gərɕa	g <sup>w</sup> riɕa	pumpkin

b.	kura	kwira	ball
	yul	ywijjəl	ghost
	xuxa	xwixa	peach
	quqa	qwiqa	artichoke
	gul	gwijjəl	goal
	guma	gwima	eraser

Recall from our presentation of the data in section 1 above that the diminutive morpheme consists of the infix *i* along with the feature [round] which docks onto any dorsal consonant which happens to be word-initially. The cases above have all the favorable conditions for labialization to take place, something that succeeds in (13a) but fails in (13b) because of a markedness constraint prohibiting the occurrence of two contiguous rounded segments. This constraint, dubbed \*ROUND ROUND after Bensoukas (2014), is formulated as follows:

(14) \*ROUND ROUND (henceforth \*Rnd<sup>2</sup>)

Sequences of round segments are prohibited.

It is this round dissimilation constraint which blocks forms such as \**k<sup>w</sup>wira* and \**y<sup>w</sup>wijjəl* from surfacing as optimal. The tableau in (15) below shows how the optimal candidate wins. Like in the TB data above, we assume that \*Rnd<sup>2</sup> must dominate the constraint MAX-Rnd to ensure that no stem surfaces with two specifications for rounding.<sup>3</sup>

(15)

kura, i [+rnd]	*Rnd <sup>2</sup>	MAX-Rnd	Ident-Rnd
a. <i>k<sup>w</sup>wira</i>	*!		*
☞ b. <i>kwira</i>		*	

In both cases the base initial vowel is realized as a glide serving as the onset of the syllable whose nucleus is the diminutive morpheme. The two forms differ in the realization of the round feature which is part of the diminutive morpheme. Candidate (15a) labializes the initial

<sup>3</sup> Instead of the constraint MAX-Rnd, Boudlal (2001) uses the alignment constraint LABIALIZE, which has the effect of labializing the leftmost labializable segment of the stem when it is a dorsal or a labial consonant. Using the constraint MAX-Rnd in the diminutive formation instead of LABIALIZE has more explanatory power since failure of part of the input morpheme to be realized means that some segment/feature of the input does not appear in the output. However, we need to point out here that the two constraints are not mutually exclusive as it will be seen down in this paper that the constraint LABIALIZE is also needed to labialize a labial consonant followed by the dorsal *w*. See section 5 for more details.

dorsal consonant despite the presence of a labiovelar glide, and in so doing fatally violates \*Rnd<sup>2</sup>, whereas candidate (15b) eschews this violation by failing to realize part of the diminutive.

Next, we look at the diminutive cases exhibiting two variant forms: one with a labialized dorsal; the other without. Here are representative items from the sets presented in (2) above:

(16)

<i>Noun</i>	<i>Diminutive noun</i>	<i>Gloss</i>
ʃɣir	ʃɣ <sup>w</sup> ijjər / ʃɣiwwər	small
rqiɣ	rq <sup>w</sup> ijjəq / rqiwwəq	thin
qʃir	q <sup>w</sup> ijjər / qʃiwwər	short

The items in (16) are reminiscent of a situation déjà vu in TB, namely that a labialized dorsal cannot co-occur with a vocoid within the same stem, a fact ensured for MA by the constraint \*Rnd<sup>2</sup> dominating MAX-Rnd. The diminutive nouns in (16) have been augmented by the addition of the default schwa syllable as proposed in Al Ghadi (1990/2014) and adopted in Boudlal (2001). The default syllable is dictated by the need to augment the output form by the addition of a schwa syllable, taking the epenthetic glide *j* as its onset and the final consonant of the stem as a coda and this to satisfy the disyllabic requirement that rules illicit forms such as \*ʃɣ<sup>w</sup>ir, \*rq<sup>w</sup>iq and \*q<sup>w</sup>ʃir.

Abstracting away from the intricacies involved in the diminutive for which a detailed analysis within the OT framework is proposed in Boudlal (2001), let us consider competitive candidates of the base ʃɣir in the tableau below:

(17)

ʃɣr, i [+rnd]	*Rnd <sup>2</sup>	MAX-Rnd	Ident-Rnd
a. ʃɣ <sup>w</sup> ijjər			*
b. ʃɣijjər		*!	
c. ʃɣ <sup>w</sup> iwwər	*!		*

The ranking given in (17) will still have to account for the variation in the pronunciations of words of the types given in (16) above since the decisive constraint will always rule illicit any form with a double specification for the feature [round].

The other alternate case to consider is the one with a non-labialized consonant occurring with the glide *w*. The constraints we have yield the following tableau:

(18)

$\text{\textit{\text{sy}r, i [+rnd]}}$	$*\text{Rnd}^2$	MAX-Rnd	Ident-Rnd
a. $\text{\textit{\text{sy}^w ijj\text{ər}}}$			*
b. $\text{\textit{\text{sy}^w iww\text{ər}}}$	*!		*
c. $\text{\textit{\text{sy}iww\text{ər}}}$		*!	

The constraints we have thus far and their ranking fail to recognize that candidate (18c) is also optimal. It is ruled out because of the non-realization of the feature [round]. However and as already seen above, the realization of the feature [round] would automatically violate the top ranked constraints against two labials. So how is it possible to also allow for correct candidate forms such as  $\text{\textit{\text{sy}iww\text{ər}}}$  and for other cases exhibiting variation?

There are two possible answers to the variation exhibited in (18). The first one is to be sought in Partial Ranking Theory (PRT) of Antilla (1997) and Antilla and Cho (1998), where variation is seen to be the result of variable dominance relations among ranked constraints. PRT allows ranking relations to be classified into at least two groups: categorical within and across dialects; and variable across dialects. It derives invariant and variable regularities by means of partially ranked constraint sets. In this respect, Rguibi (2001) applies PRT to the study of aspects of language variation in the Tazi variety of MA compared to Average MA. She concludes that the theory allows deriving two partial rankings from a single grammar. However and despite its efficacy in the MA variations described in Rguibi (2001), we will not make recourse to it because we believe that the  $\text{\textit{\text{sy}^w ijj\text{ər}}}/\text{\textit{\text{sy}iww\text{ər}}}$  case does not necessarily reflect dialectal differences since the same individual might alternately use both forms. For this reason, we are bound to abandon this solution in favour of a more feasible one.

The second possible answer to variation cases such as those in (16) above, which tends to provide satisfaction, is to simply assume that the  $w$  in the alternate diminutive form is no more than the feature [round] which is part of the diminutive morpheme. By virtue of the constraint MAX-Lab, this feature has to find a terminal element to dock on to: the initial dorsal consonant or the onset of the default schwa syllable created to satisfy the disyllabicity requirement imposed on the output of the diminutive. When the feature docks on to the initial dorsal, recourse is made to the vowel of the diminutive to provide the onset to the default schwa syllable, producing the output  $\text{\textit{\text{sy}^w ijj\text{ər}}}$ . If the feature [round] comes to occupy the onset of the default syllable, it cannot



simultaneously dock on to the dorsal consonant because this would constitute a flagrant violation of the constraint \*Rnd<sup>2</sup>. We will not pursue the matter here as it is not the primary focus of the present paper, but suffice it here to reiterate that the *ʃy<sup>w</sup>ijjar/ ʃyiwwar* variation provides support to our hypothesis, namely that dissimilation of this type can only be a copy of the state of affairs exhibited by the variety of TB described in Bensoukas (1999, 2014). We turn next to consider a round dissimilation process taking place within a more productive class of labiovelarized and germinated labial consonants [b, f, m].

## 5. Further effects of Labial/round dissimilation

Up to now the MA data considered reflects dissimilatory cases that have been copied from TB, the Amazigh variety considered. In this section, we will consider dissimilation cases that testify to what might be called structural borrowing; i.e. dissimilation cases in MA that are not available in TB. The section will particularly deal with the velarization and gemination of the labial consonants *b, f, m*. We will argue that *bb<sup>w</sup>, ff<sup>w</sup>, mm<sup>w</sup>* are themselves cases involving a dissimilatory process of labial/round segments. The section will also stop at a dissimilation process involving the vocoids *u* and *w* and finally touch on some apparent dissimilation cases.

### 5.1 Round dissimilation within Labiovelarization

MA has a set of labials which undergo a process referred to as phonological labiovelarization, whereby any member of the class [b, f, m] is labialized and then geminated to surface as [bb<sup>w</sup>, ff<sup>w</sup>, mm<sup>w</sup>]. The labiovelarization is the result of the juxtaposition of the labial consonant and the dorsal *w*, a case of OCP labial we assume to derive from conjoining two constraints.<sup>4</sup> Consider the examples below for illustration:

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<sup>4</sup> The initial labialized geminate in the items *bb<sup>w</sup>a* ‘my father’ and *mm<sup>w</sup>i* ‘my mother’ does not seem to be the result of the juxtaposition of a labial and *w*. *\*bwa* and *\*mwi* are not attested MA words and as such we think that the augmentation of the words by geminating their initial consonants is dictated by minimal word requirements.

(19)

<i>Singular</i>	<i>Plural</i>	<i>Diminutive</i>	<i>Gloss</i>
mus	mm <sup>w</sup> as / *mwas	mm <sup>w</sup> ijjəs / *mwis	knife
buq	bb <sup>w</sup> aq / *bwaq	bb <sup>w</sup> ijjəq / *bwiq	loud speaker
fuṭa	ff <sup>w</sup> aṭi / *fwaṭi	ff <sup>w</sup> iṭa / *fwiṭa	towel
fasi	ff <sup>w</sup> asa / *fwasas	ff <sup>w</sup> isi / *fwisi	native to Fes

What one expects is the unattested forms to surface as plurals or diminutives, but that does not happen, at least in what Boudlal (1998, 2001) and Caubet (2006) call southern varieties of MA in which an unattested plural form such as \*fwati is ruled illicit because it violates the OCP constraint against aligning two labials within the same stem. The OCP has the effect of labializing the initial consonant and geminating it.<sup>5</sup> It should be noted here that the asterisked cases in (19) are well attested in other varieties of MA, particularly in the northern varieties as described in Harrell (1962).

The process labializing and geminating labial consonants is very productive and extends to loanwords which have been integrated into the language as shown by the data below:

(20)

<i>Singular</i>	<i>Plural</i>	<i>Diminutive</i>	<i>Gloss</i>
muṭur	mm <sup>w</sup> aṭər / *mwaṭər	mm <sup>w</sup> iṭir / *mwiṭir	motorcycle
baliza	bb <sup>w</sup> aləz / *bwaləz	bb <sup>w</sup> iliza / *bwiliza	suitcase
bulisi	bb <sup>w</sup> aləs / bwaləs	bb <sup>w</sup> ilisi / *bwilisi	a police officer
babur	bb <sup>w</sup> abər / bwabər	bb <sup>w</sup> ibir / *bwibir	a ship

The cases of labiovelarization presented above have been dealt with in Boudlal (2001) in a much straightforward manner, evoking mainly markedness constraints against geminated labials of the type proposed in (21) below, where the geminate TT<sup>w</sup> stands for the class of coronals, HH<sup>w</sup> for pharyngeals, KK<sup>w</sup> for dorsals and finally BB<sup>w</sup> for labials.

<sup>5</sup> Note here that not all cases of a labial followed by *w* result in labialization. Boudlal (2001) presents items such as *m-wəlləf* ‘used to,’ *m-wəddər* ‘lost,’ *b-walu* ‘with nothing’ and *f-wad* ‘in a river,’ where the passive participle prefix *m-* and the prepositions *b-* or *f-* fail to labialize, thus clearly violating OCP. However specifying that the domain of labialization in items such as those in (19) is the stem would explain its failure to apply at the level of the word where the passive participle prefix *m-* and the prepositions *b-* or *f-* are introduced.

$$(21) \quad *TT^w, *HH^w, *KK^w \gg *BB^w$$

The ranking of these constraints show that the only velarized initial geminates are the labials and as such the velarization of any other class will be ruled out. Let us see how a plural form such as *ff<sup>w</sup>aṭi* from the root *fuṭ* (in *fuṭ-a* ‘towel’).<sup>6</sup> We also borrow from Bensoukas (2014) the constraint *\*PL/Labial*<sup>2</sup> to substitute the OCP (Lab) whose effect is derived from constraint interaction. To ensure that a sequence of a labial consonant and *w* triggers labialization, the constraint *\*PL/Labial*<sup>2</sup> needs to dominate LABIALIZE as shown below:<sup>7</sup>

(22)

fuṭ, {a ... i}	<i>*PL/Labial</i> <sup>2</sup>	LABIALIZE	Ident-Rnd
⇒ a. ff <sup>w</sup> aṭi			**!
b. fwaṭi	*!		
⇒ c. f <sup>w</sup> aṭi			*

Note here that instead of choosing the candidate with the initial geminate consonant, the constraints in (22) make the wrong prediction as to the correct output form.<sup>8</sup> However, given the grammar of MA, only form (22a) should be ruled as licit, a fact which calls for other constraints. Boudlal (2001) shows that the failure of words with singleton labials to velarize is dictated by the markedness constraints in (23) below:

$$(23) \quad *T^w, *H^w, *B^w \gg *K^w$$

The ranking proposed has it that only dorsals labialize, a fact we have already shown in the data presented in (1) and (2) above and also in the dissimilatory cases discussed in the previous sections. The ranking also accounts for the non-labialization of the classes of coronals, pharyngeal and labials. Given the facts of the language, it seems that in order to allow for the

<sup>6</sup> I assume, following Alghadi (1990/2014), that the input to the plural is the nominal root.

<sup>7</sup> Note here that both the constraints LABIALIZE and MAX-Rnd are needed to account for Labial/round relations in MA. It has been shown above that the constraint MAX-Rnd forces the feature [round] to appear in the output candidate unless this constitutes a fatal violation of the constraint against having two round segments. The constraint LABIALIZE triggers labialization of labial consonants when they are followed by *w* and this to avoid violation of the constraint against having two specifications for the [labial] articulator.

<sup>8</sup> Boudlal (2001) justifies the gemination of the initial consonant in words such as those in (17) by invoking a constraint he labels INITIAL-CC, which has the effect of ruling out words with singleton labialized initial consonants. However, Bensoukas (p.c.) points out to me that the germination might simply be the product of a coalescence process resulting in total assimilation (leading to gemination) of the labials *b, m, f* with the following *w* and maintenance of rounding as a secondary articulation, leading to labiovelarization.

form in (22a) to surface as grammatical, both  $*B^w$  and  $*PL/Labial^2$  will have to dominate the constraints LABIALIZE and  $BB^w$  which in turn must dominate IDENT-Rnd as shown in (24):

(24)  $*PL/Labial^2, *B^w \gg LABIALIZE \gg *BB^w \gg IDENT-Rnd$

The tableau in (25) shows how the ranking in (24) yields the correct output  $ff^w a\dot{i}$  which is chosen among other competing candidates:

(25)

fuṭ, {a ... i}	$*PL/Labial^2$	$*B^w$	LABIALIZE	$*BB^w$	IDENT-Rnd
a. $ff^w a\dot{i}$				*	*
b. fwaṭi	*!				
c. $f^w a\dot{i}$		*!			*

The ranking shows that any form susceptible to contain two labials resorts to the labialization of its initial consonant and its germination, something ensured by the constraints given in (24).

Having shown how labiovelarization is accounted for in MA, we move next to see the way these cases relate to dissimilation and the Amazigh substratum hypothesis we have been arguing for in this paper. An interesting example that is worth considering here is that of the diminutive forms of the nouns given in (19) and (20) above. Recall here that the diminutive morpheme consists of the vowel *i* infixed after the second consonant of the base noun along with the feature [round] which docks on to any dorsal consonant (Lasri 1989, Al Ghadi 1990/2014, Boudlal 2001). To see how this works, let's take the example *fuṭa* <  $ff^w i\dot{a}$ . The tableau below shows how the form  $ff^w i\dot{a}$  is obtained:

(26)

fuṭa, {i, +rnd}	$*PL/Labial^2$	$*B^w$	LABIALIZE	$*BB^w$	IDENT-Rnd
a. $ff^w i\dot{a}$				*	*
b. fwiṭa	*!				
c. $f^w i\dot{a}$		*!			

The constraints generate the desired output form although the feature [round], which is part of the diminutive morpheme, has not been realized in the winning candidate. The non-

realization of this feature leads to violation of the constraint MAX-Rnd, which has the effect of penalizing any form that does not realize part of the input morpheme.

One might wonder why part of the diminutive morpheme has not be realized. Well again here the answer is to be sought in labial dissimilation in MA and how it relates to MAm. We have shown that any presence of two round segments within the same stem is illicit and as such the realization of the featural morpheme would generate obsolete forms such as *\*ff<sup>ww</sup>iṭa*.

(27)

fuṭa, {i, +rnd}	*Rnd <sup>2</sup>	MAX-Rnd	LABIALIZE	Ident-Rnd
a. ff <sup>ww</sup> iṭa	*!			*
☞ b. ff <sup>w</sup> iṭa		*		*

The ranking applies even to items with underlying labialized dorsals. If we take a noun such as *g<sup>w</sup>ḥffa* “basket,” we expect the diminutive form to surface without the realization of the feature [round]. Consider the tableau in (28) below for illustration.

(28)

g <sup>w</sup> ḥfa, {i, +rnd}	*Rnd <sup>2</sup>	MAX-Rnd	LABIALIZE	Ident-Rnd
a. g <sup>ww</sup> ḥfa	*!			*
☞ b. g <sup>w</sup> ḥfa		*		

Once again the failure of part of the diminutive morpheme to be realized in the output candidate is the result of constraint application. It is the result of the interaction of the markedness constraint \*Rnd<sup>2</sup> with the faithfulness constraints MAX-Rnd and IDENT-Rnd.

Unlike the cases considered in section 4, which seem to lend support to the Amazigh substratum hypothesis and for which we adopted the analysis proposed in Bensoukas (2014), the cases considered in this section show that MA has started to be productive by taking the TB dissimilatory process to a different level to apply it to cases that do not exist in TB -the donor language.

We move in the next section to consider other dissimilation cases that do not seem to lend support to the Amazigh substratum hypothesis. These involve mainly vocoids.

## 5.2 More on dissimilation

The next cases of dissimilation we'll consider testify to what should be clear cases of structural borrowing. These are probably not rooted within the Amazigh substratum hypothesis but nonetheless justify the OT analysis we proposed earlier. These cases involve the dissimilation of the first of two round segments in the passive participle (PP) as shown by the examples below:

(29)

<i>Verb</i>	<i>PP</i>	<i>Unattested PP</i>	<i>Gloss</i>
ʃaf ~ ʃuf	məʃʃuf	* məʃwuf	see
lah ~ luḥ	məʃjuḥ	* məlwuḥ	thrown
ʃaṭ ~ ʃuṭ	məʃjuṭ	* məʃwuṭ	blow
sas ~ sus	məʃjus	* məswus	undust

Putting aside the *a~u* alternation exhibited by these items, which we assume could be accounted for by an allomorphy rule,<sup>9</sup> we explain how the output form is obtained. Let us take the case of the candidate *məʃʃuf*. The relevant constraints are \*Rnd<sup>2</sup> and IDENT-Rnd.

(30)

ʃuf, m ... (u)	*Rnd <sup>2</sup>	IDENT-Rnd
a. məʃʃuf		*
b. məʃwuf	*!	

Note here that it is the rounded vocoid of the stem that dissimilates instead of the vowel indicating the passive participle, a fact which shows that the right-to-left directionality effect of dissimilation is observed. The output candidate shows that MA cannot tolerate a stem with two specifications for rounding, where the first is the glide *w* and the second the vocoid *u*.

[Round] dissimilation involving *wu*, exhibited by the items in (29) above, is not widely productive in MA and may take place from right to left at the right edge of stems, particularly vowel-finally with the rounded sequence reversed as the examples in (31) show:

<sup>9</sup> Al Ghadi (1990/2014) assumes that the *a~u* alternations could be accounted for by an allomorphy rule. For him, the vowel *a* appears only in the third person singular and plural of the perfective form of the verb, whereas the vowel *u* appears in all the other persons and verb forms.

(31)

<i>a.</i>	<i>Base Noun</i>	<i>Nisba</i>	<i>Unattested</i>	<i>Nisba Gloss</i>
	ʔaməzzɾu	məzzriwi	*məzzɾuwi	from Amezrou
	ʃəfɾu	ʃəfriwi	*ʃəfɾuwi	from Sefrou
	bzu	bziwi	*bzuwi	from Bzou
<i>b.</i>	<i>Singular</i>	<i>Plural</i>	<i>Gloss</i>	
	ʔablu	ʔabluwat/ ʔablujat	board	
	kamiju	kamijjuwat/ kamijjujat	truck	
	rubu	rubuwat/ rubujat	robot	

The nouns in (31a) refer to names of localities; those in (31b) are loans that have been integrated in MA. Both sets contain nouns whose final segment is a vowel which is juxtaposed with another vowel, namely the nisba suffix *-i* and the plural suffix *-at*. The hiatus is resolved by epenthesis of the glide *w* to serve as an onset to the syllable whose nucleus is the suffix vowel. However, the two nouns behave differently with respect to the sequence *uw*. The sequence *uw* in (31a) obligatorily dissimilates to *iw*, with the stem-final vowel being the segment that undergoes change, whereas the same sequence in (31b) stays as it is or dissimilates to *uj*, giving way to an alternative pronunciation.

Unlike data on MA presented in the previous sections, which are amenable to an analysis much like the one proposed for TB in Bensoukas (1999, 2014), thus confirming the Amazigh substratum hypothesis, the data in this section are variable in nature and fail to be captured in terms of clear generalizations applicable to similar cases. Here are sets of data presenting a repetition of the [round] feature within the same stem but showing a different behavior with respect to dissimilation.

(32) Data from Imouzaz (2002, p. 218)

<i>UR</i>	<i>Singular Noun</i>	<i>Gloss</i>
ʃɪfur	ʃɪfur	driver
furuɜ	fɪruɜ	traffic lights
kuluɟ	kɪluɟ	underwear
mulud	milud	Proper noun

a.	muṭur	muṭur	motor/engine
	ʃumur	ʃumur	unemployed
	qubul	qubul	acceptance/approval
	ʕumur	ʕumur	age

The items in (32a) dissimilate the first of two rounded segments to yield the vocalic sequence *i ... u* which spares violation of the constraint \*Rnd<sup>2</sup>. Those in (32b) surface with both rounded vowels, clearly violating the locally conjoined constraint on rounding. Imouzaz (2002) has provided answers to the discrepancy between the sets in (32) by invoking solutions within the OT framework. The relevant aspect in these data for our arguments is that this type of dissimilation is far from being comparable to the delabialization of dorsal consonants considered in the previous sections. The dissimilatory cases considered in this section show that \*Rnd<sup>2</sup> is not only part of the grammar of MA, but it extends to other cases as well which are not attested in TB, the donor language.

### 5.3 Apparent dissimilation

The final set of data to consider here exhibits what might be referred to as dissimilation. These involve sequences such as *aw*, where *a* stands for the active participle morpheme as evidenced by the examples in (33) below:

(33)

<i>Verb</i>	<i>Passive participle</i>	<i>Causative</i>	<i>Verb gloss</i>
daq ~ duq	dajəq / *dawəq	dəwwəq	taste
kan ~ kun	kajən / *kawən	kəwwən	be
ʃam ~ ʃum	ʃajəm / *ʃawəm	ʃəwwəm	fast
dab ~ dub	dajəb / *dawəb	dəwwəb	dissolve
ʃaf ~ ʃuf	ʃajəf / *ʃawəf	ʃəwwəf	see

The *u* of the verb, which reappears as *w* in the causative, changes to *j* in the active participle after the affix *a* marking this category. An alternation of this type, which does not match the labial/round dissimilation cases considered so far, does not find much support in the language as it only occurs in this particular morphological category. Explaining these cases in terms of the constraints proposed thus far would take us beyond the scope of this paper.



However, an alternative analysis in terms of ablaut-based derivational morphology appears to be possible and is actually available in Heath (1987).

To sum up this section has shown that MA exhibits a [round] dissimilatory case that does not relate to the cases considered in the previous section. This dissimilation affects the labiovelarized consonants  $bb^w, ff^w, mm^w$  and the vocoids  $w/u$  and does not seem to lend support to the Amazigh substratum hypothesis.

## 6. Conclusion

The paper has provided an OT analysis of the cases of labial dissimilation in MA. The choice of this process stems from language internal evidence and our belief that a number of linguistic phenomena in MA, including dissimilation, cannot be adequately accounted for without reference to the grammar of the Amazigh language. Our work aligns with previous accounts assuming the existence of an Amazigh substratum in MA, namely Bensoukas and Boudlal (2012a-b), Elmedlaoui (1992/1995, 1998, 2000) and related works.

We have shown that the first type of dissimilation affecting labialized dorsals is the result of the influence of TB as described in Bensoukas (1999, 2014). We have shown that there are two instances where the rounding on the dorsal consonants fails to appear. The first of these takes place when double specifications for rounding would lead to a form where the labialized consonant co-occurs with a rounded vocoid as in  $\$yiw\bar{w}ar$ , as opposed to  $*\$y^wiw\bar{w}ar$ . The other case considered in this paper relates to a situation where part of the diminutive morpheme, namely the [round] feature is not realized despite the presence of a labializable segment. The reason is that its realization would lead to violation of the constraint  $*Rnd^2$  ( $kwira$  as opposed to  $*k^wira$ ). In this sense the markedness constraint has a blocking effect which makes sure that the sequence of two rounded segments never arises.

The paper has the merit of treating dissimilation in cases that involve the velarization of labial consonants and their germination. We have shown that these cases also involve the dissimilation of the feature [round], particularly when the result would lead to an obsolete output consisting of a segment doubly specified for rounding such as  $*ff^wita$ .

Finally, we have shown that not all the dissimilatory cases considered in this paper reflect the Amazigh substratum hypothesis. We have shown that there are separate unrelated sets of

items exhibiting a type of dissimilation which seems to be typical of MA, involving two vocoids and testifying to what we referred to as structural borrowing.

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