

The Morphology of Borrowings and Its Relevance To Lexical Organization in Moroccan Arabic¹

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ملخص

يعالج هذا المقال بنية المعجم وآليات تنظيمه. و ترمي هذه المقالة إلى تحديد بنية الجذر و خصائصه المعجمية في الدارجة المغربية. ومن ثم هل يمكن اعتبار الجذر اللغوي أصلاً للاشتقاق أم الكلمة. للإجابة عن هذه الإشكالية قمنا بدراسة بعض صيغ الصرف المتعلقة بالكلمات المقترضة بعد إدماجها في الدارجة المغربية خاصة الاشتقاق الرجعي، صيغة المصدر، و صيغ الجمع. و تخلص المقالة إلى أن معجم الدارجة المغربية يجمع بين الجذر اللغوي و الكلمة كأصل للاشتقاق، إذ يتخذ كل من الاشتقاق الرجعي و صيغ جمع التكسير الجذر اللغوي كأصل للاشتقاق، بينما تعتبر صيغة المصدر و الجمع السالم الكلمة هي الأصل. كما توصلت دراسة صيغ الجمع إلى تقسيم معجم الدارجة إلى ثلاثة مستويات: الأول لاتعاقبي، الثاني تعاقبي، و الثالث يضم الكلمات ذات الصرف المعبر.

Abstract:

The present paper examines the morphology of loans beyond integration in Moroccan Arabic (MA). It provides an insight into lexical organization as well as the status of the consonantal root in MA. It thus contributes to the C-root vs. stem/word characterization of the base of derivation in Hamitic-Semitic. This work deals particularly with loan inflectional and derivational processes including backformation, French loan infinitives and loan plural formation in MA. While backformation provides evidence for the C-root as a base of derivation, French loan infinitives support a stem-based approach; loan pluralization, on its part, calls for both approaches, the sound plural being stem-based and the broken plural root-based. Additionally, loan plurals reveal the organization of MA lexicon into three distinct strata: the non-concatenative, the concatenative and the extragrammatical. The first stratum corresponds to the C-root while the second and third support a stem-based approach. We conclude, thus, that the MA lexicon is organized around both a C- root as well as a stem.

Keywords: Moroccan Arabic, borrowings, morphology, lexical organization, root-based vs. stem-based.

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1. Introduction

The study of loanwords has increasingly gained the interest of different scholars in an attempt to explain the factors involved in loanword adaptation. When a language adopts a loanword into its linguistic system, it tries to bring it in conformity with the phonology and morphology of the language (Yip, 1993). To this end, loanwords undergo phonological and morphological integration.

Three different approaches to loanword adaptation have emerged in the literature. First, the phonological approach assumes that loanword adaptation is based on bilinguals' competence in both the source and recipient languages (Paradis & La Charité, 1997; Paradis, 2006). A contrasting view is the perceptual approach, which argues that adaptation is determined by perceptual and acoustic factors. It claims that during the adaptation process, borrowers have access to the phonology of the native language only, whereas access to non-native phonological structure is systematically deactivated (Peperkamp and Dupoux, 2003). Opposing the phonological model, Peperkamp (2005) provides further counterevidence from loanword adaptations which resist conforming to the native phonology. A third intermediate position combining both phonological and perceptual factors has been articulated by researchers such as Silverman (1992), Kenstowicz (2003), Shinohara (2004), Yip (2006), and Louriz (2004, 2015), and Kenstowicz and Louriz (2009) among others. This view posits that various factors come into play to obtain the optimal shape of the loan, including phonetics and orthography. In the absence of similar sounds in the native system, the adapter uses his/ her inner knowledge of phonetic similarity to adapt foreign forms. Nevertheless, despite their contribution to the understanding of loanword adaptation, these scholarly works all focused mainly on the phonological and morphological aspect of loanwords in the course of borrowing and adaptation, but none of them, to my knowledge, discussed their status beyond integration.

The present paper aims at filling this gap. It examines the morphology of loanwords in MA shedding light on their behavior beyond integration. It provides an insight into lexical organization and the nature of the base of derivation in Moroccan Arabic (MA) from the perspective of the morphology of integrated borrowings. This work deals particularly with loan inflectional and derivational processes including backformation, French loan infinitives and loan plural formation in MA. The argument advanced in this paper is that MA lexicon

is organized around both a C-root and a fully vocalized stem. Evidence for the lexical status of the C-root is first provided from backformation in loanwords. The claim is that the C-root is extracted from integrated loan-nouns to serve as a base for the formation of new morphological forms. The perfective morphology of French loan infinitives, on the other hand, shows that they display the same ablaut behavior of [-i] final verbs in MA (*frani*, *frana* ‘brake’ in analogy with native *mfi*, *mfa* ‘go’), hence, suggesting a stem-based characterization of the base. Loan pluralization, on its part, calls for a combination of both root-based and stem-based approaches. There are two types of plural in MA: the common sound (SP)/broken plural (BP) and a ‘special’ *-at* plural. The sound and ‘special’-*at* plurals involve suffixation to a stem-base while the broken plural involves the mapping of a C-root to BP patterns. Loan pluralization further reveals the stratification of MA lexicon into three distinct strata: the non-concatenative (native and integrated loans, BP), the concatenative (native nouns, SP) and the extragrammatical (Zwicky and Pullum, 1987; Mattiello, 2013) stratum (native and semi-/unintegrated loans, *-at* plural).

The rest of the paper is articulated as follows. After setting the scene, we explore in section 2 the morphological behavior of back-formed loans as well as integrated French loan infinitives in MA. Section 3 explores loanword plural formation. Section 4 establishes the relevance of loanword morphology to lexical organization and stratification in MA, showing that loanwords lend support to both a C-root and a stem/word characterization of the base of derivation in MA. Section 5 concludes the paper.

2. Lexical storage

2.1. Backformation from loan-nouns as root extraction

Backformation is a historical process, often described in the literature as a minor word formation process (Heath, 1989; Staskova, 2013). It consists in “the coining of a new word by taking an existing word and forming from it a morphologically more elementary word” (Staskova, 2013:9). It is described by Pennanen (1966) cited in Staskova (2013:10) as “...a kind of inverted or reversed derivation. Normally, derivation means the formation of new words from existing ones by means of affixes. Backformation works in the opposite direction, i.e. from what it is, or looks like, or is taken for a derived form, backwards to the ‘root’, which does not really exist”. The most frequent type of backformation in English involves

de-suffixation of nouns to form verbs as in the case of the pair *editor* > *edit*, formed in analogy with similar English words involving suffixation (e.g. *credit* > *creditor*, *act* > *actor*). It is worth noting that the formation of verbs from nouns via backformation often concerns loan-nouns, mainly from French or Latin (Staskova, 2013).

In the case of borrowings, backformation can also be used as a loanword integration strategy. There are instances in MA where singular loan-nouns are based on plural forms in the source language. A case in point is the loan-noun /*zufrija*/ ‘playboys’ from French *les ouvriers* ‘the workers’, from which the singular form /*zufri*/ is derived via backformation (Heath, 1989: 151-152). The loanword *zufrija* was borrowed and integrated in MA as one stem combining the last sound of the definite article ‘les’, namely *z*, and the noun ‘ouvriers’. The term *zufrija* is used in MA to refer to single men. This semantic change might be attributed to sociolinguistic factors related to the status of the workers at the time of borrowing, who were mainly single living alone. The translation of *zufrija* as ‘playboys’ was adopted from Heath (1989). Another word-formation operation based on loan-nouns consists in forming a verb by extracting a consonantal root from an integrated loan-noun. This word-formation process was examined by Ziani (2018), who claims that the extracted verbal root serves, as a base for the derivation of other morphological categories including the medio-passive, the passive participle, and the deverbal noun, in analogy with the native patterns of derivation. Some examples are provided below (see Ziani, 2018 for more details).²

(1)	< <i>costume</i> > ‘suit’	< <i>cravate</i> > ‘tie’	< <i>rendez-vous</i> > ‘appointment’
<i>Loan-Noun</i>	<i>kustim</i>	<i>grafaṭa</i>	<i>randifu</i>
<i>Root/ Verb</i>	√ <i>kstm</i> → [kəstəm]	√ <i>grfṭ</i> → [gərfəṭ]	√ <i>rndf</i> → [rəndəf]
<i>Gloss</i>	‘wear a suit’	‘wear a tie’	‘have an appointment’

Ziani (2018) holds that the items in (1) can be claimed to be a clear case of backformation. The MA data in (1) is special in that backformation does not result in a word proper but rather yields a C-root that the morphology uses in deriving new words. Although the loan nouns contain both vowels and consonants, only the consonants are extracted for the

² IPA transcription is adopted, except for the dot underneath segments indicating emphatics. Gemination is transcribed by doubling the consonant. The following abbreviations are used: AM = Amazigh; BP. = Broken Plural; C-Root = Consonantal Root; dim. = diminutive; fem. = feminine; Fr. = French; gl. = gloss; inf. = infinitive; masc. = masculine; MA = Moroccan Arabic; NCM = Non-concatenative Morphology; or. = origin; pl. = plural; SP. = Sound Plural; Sp. = Spanish; sg. = singular.

derivation of verbs, in analogy with existing native verbs such as \sqrt{trzm} ‘translate’, $\sqrt{frg\zeta}$ ‘explode’, and \sqrt{krkb} ‘roll’. The claim is that, what is extracted is exactly the C-root, a constituent that does not contain vowels. After extraction of the root from loan-nouns, other morphological categories are derived based on the same root including both concatenative and non-concatenative processes as I will show immediately.

2.1.1. Concatenative processes

The analysis of the derivation of the morphological patterns of loans based on backformation has revealed that parallels could be noticed between MA native roots and loans in forming the medio-passive and the passive participle from the root extracted via backformation. The medio-passive simply means the passive, but it is never followed by a preposition corresponding to the English ‘by’ (Harrell, 1962). It is formed through the prefixation of *t-* to a base form. The passive participle, on its part, is obtained through the prefixation of the morpheme *m-* to a verb root. An illustrating example is the base form $\sqrt{frg\zeta}$ ‘to make something explode’ from the quadrilateral root $\sqrt{frg\zeta}$ ‘explode’, with the medio-passive *t- $\sqrt{frg\zeta}$* ‘to explode, to be exploded’ and the passive participle *m- $\sqrt{frg\zeta}$* ‘having exploded’. According to Ziani (2018), the root $\sqrt{frg\zeta}$, undergoes normal affixation to form the medio-passive and the passive participle forms, respectively. The phonetic form is then completed by epenthesizing schwa(s) in appropriate places, according to MA syllable structure.³

Concerning loans, the set in (2) below illustrates their derivational behavior with regard to the medio-passive and the passive participle based on the extracted C-root.

(2)	<i>Root</i>	<i>Origin / Gloss</i>	<i>Medio-passive</i>	<i>Passive participle</i>
	$\sqrt{?ntk}$	<antique> ‘elegant’	t- $\sqrt{?ntk}$	m- $\sqrt{?ntk}$
	\sqrt{grft}	<cravatte> ‘tie’	t- \sqrt{grft}	m- \sqrt{grft}
	\sqrt{kstm}	<costume> ‘suit’	t- \sqrt{kstm}	m- \sqrt{kstm}

The parallelism between native and loanwords becomes apparent, as the latter use exactly the same morphology as native forms. They can only do so, however, after the extraction of the C-root.

³ There are two types of syllabification in MA: full-vowel syllabification [i, u, a] and schwa syllabification [ə]. Benhallam (1990-a) proposes a four-step Syllable Structure Assignment Algorithm proceeding from right to left (See Benkaddour (1982); Al Ghadi (1990/2014, 1994); and Boudlal (2001, 2006) for a review of syllable structure in MA).

As pointed out above, this reveals the essential role the C-root plays in lexical organization in MA (Ziani 2018).

2.1.2. Non-concatenative processes

As far as root-and-pattern morphology is concerned, the categories of the medio-passive, the passive participle, and the verbal noun are derived through the combination of roots and patterns. For instance, a form such as *tbuħəl* ‘he acted stupidly’ (medio-passive) is derived from the root $\sqrt{bħl}$ initially on the pattern *CuCaC*. Similar to the example above, the passive participle is obtained through the prefixation of *m-* to the base form. The verbal noun, which refers to ‘the activity or state indicated by the verb from which it is derived’ (Harrell, 1962:60) is usually formed for trilaterals and quadrilaterals following one of these patterns respectively: /t-CCCiC/ ‘*tǧərgiʕ*’ ‘explosion’, / t-CuCiC/ ‘*tbuħil*’ ‘stupidity’ or /t-CiCiC/ ‘*tmixil*’ ‘eat’ (slang) (Heath, 1989:82, 119).

As far as loanwords are concerned, the data in (3) illustrate the productivity of the extracted C-roots.

(3) *Loan forms*

<i>Root</i>	<i>Origin / Gloss</i>	<i>Medio-passive</i>	<i>Passive Participle</i>	<i>Verbal Noun</i>
\sqrt{bgs}	<beau gosse> ‘handsome’	t-ḃugəṣ	m-ḃugəṣ	tḃugiṣ
\sqrt{sfz}	<sauvage> ‘savage’	t-ṣufəz	m-ṣufəz	tsufiz
\sqrt{fmr}	<chômeur> ‘jobless’	t-ḟumər	m-ḟumər	tḟumir(a)
\sqrt{sgr}	<seguro> (Sp.) ‘to insure’/ ‘to be insured’	t-sugər	m-sugər	tsugir
\sqrt{srt}	<sarut>(AM) ‘key’	-	m-surət	-

Here again, it is clear that the pattern is similar to native words. Ziani (2018) states that when derived from the triconsonantal roots extracted from loan nouns, these forms are revealing examples. In their derivation, roots are combined with patterns to form, respectively, the medio-passive, the passive participle and the verbal nouns in analogy with native words.

Commenting on an earlier version of the present paper, a reviewer made an interesting comment with regard to the data set in (3) pointing out that the loan-nouns <beau gosse>

[bo gəs], <sauvage> [sovaʒ], and <chômeur> [ʃomœʁ] all contain a vowel [o]⁴. Thus, it might be claimed that the vowel *u* in the derived forms (medio-passive, passive participle and verbal noun) is transferred from the source language. For instance, the medial *u* in the medio-passive forms *t-ḥugəs*, *t-ṣufəʒ*, and *t-fumər* might be claimed to be the result of phonological adaptation. However, other loans do carry the vowel *u* in the host language despite the fact that the vowel in question does not emerge in the source language. The last two forms ‘seguro’ and ‘sarut’ constitute counter examples and support our claim. The loan-noun *seguro* [se-gu-ro] does not contain the vowel [o]. Instead, the [o] slot is filled with the vowel [i], yielding the forms *t-sugər* (mediopassive), *msugər* (passive participle) and *t-sugir* (verbal noun), respectively. In the case of Amazigh loan *sarut* ‘key’, the vowel [a] occupies the [o] position. Still, the forms *surt* and *msurət* (perfective and passive participle, respectively) are derived on the pattern *CuCC*. It is worth noting that while some loanwords may have a full paradigm, others have a limited derivational pattern. This might be attributed to the degree of integration of these loans in MA. These examples reveal that the medial *u* is inserted by the pattern morphology rather than being a mere transfer from the source language.

2.2. French loan infinitives

Integrated French infinitives⁵ with final *-er* pronounced [e], as in *freiner* ‘brake’, undergo phonological integration, through the adaptation of the donor language final front, mid unrounded vowel [e] as the corresponding high vowel [i]. Subsequent to that, the integrated verb form carrying a final [i] serves as a base of derivation. An important and insightful observation about the behavior of loan infinitives beyond integration is that this class of verbs is interestingly subject to vowel ablaut in the same fashion [i]-final native verbs are. Examples of vowel-final verbs are provided in (4):

⁴ I would like to thank a reviewer for kindly pointing this out to me.

⁵ In a comparative study, Bensoukas, El Hamdi and Ziani (2017) examined the morphological behavior of integrated French loan-infinitives in Moroccan Amazigh (AM) and Moroccan Arabic (MA). The authors use the preterit/ perfective morphology of AM and MA to highlight the existing discrepancies at the level of the morphology of the integrated loan-infinitives as well as at the level of lexical organization. The study revealed that French loan infinitives exhibit i/a-ablaut in MA only, but not in AM. (See Bensoukas, El Hamdi & Ziani 2017 for details).

(4)	<i>MA</i>	<i>Gloss</i>
	mʃi-t/ mʃa	‘I/he went’
	ʒri-t/ ʒra	‘I/he ran’
	kli-t/ kla	‘I/he ate’
	ʃri-t/ ʃra	‘I/he bought’

The behavior of integrated French infinitives is clearly shown in (5) below, taken from Bensoukas, El Hamdi & Ziani (2017:7), where the loan verb *frani/ frana* ‘brake’ behaves in the same way as the native verb *mʃi/ mʃa* ‘go’ in the perfective. The alternation of [i] and [a] depends on person: [i] is used with 1st and 2nd person and [a] with 3rd person.

(5)	<i>Fr. Loan inf. ‘brake’</i>		<i>Native verb ‘go’</i>	
	<i>Sg.</i>	<i>Pl.</i>	<i>Sg.</i>	<i>Pl.</i>
1	frani-t	frani-na	mʃi-t	mʃi-na
2	frani-ti	frani-tu	mʃi-ti	mʃi-tu
3	<i>Masc.</i> fran-a		mʃ-a	
		frana-w		mʃa-w
	<i>Fem.</i> frana-t		mʃa-t	

In the case of loan infinitives, the claim made is that what the morphology has access to in MA is the integrated verb base ending in the vowel [i]. As shown above, the inflectional morphology of these verbs uses an ablaut operation that manipulates a final vowel. As such, an entirely consonantal root cannot be claimed to be the base of derivation of verbs like *ʃri* ‘buy’. Similarly, French loan infinitives call for characterizing the base of derivation in [i]-final verbs as a form containing a vowel. These facts pave the ground for the conception of the base of derivation of vowel ending verbs as stem-based (Heath, 1987; Gafos, 2009) or at least one based on a syllabic root⁶ (Arad, 2005; Prunet, 2006; Bensoukas, El Hamdi & Ziani, 2017).

⁶ Unlike consonantal roots constituted of an unpronounceable string of consonants, the syllabic roots are claimed to be pronounceable on their own. They can be made of consonants only or of both consonants and vowels. (See Arad (2005) and Prunet (2006) for review).

To summarize the argument so far, the morphology of loans in MA calls for different bases of derivation. While back-formed forms justify an exclusively consonantal root base, loan infinitives cannot be explained unless the base of derivation contains a vowel.

3. Loan pluralization in MA

3.1. Plural formation in MA: sound / broken and -at plural

Moroccan Arabic displays two types of pluralization. The first type, referred to as ‘normal’ pluralization by Bensoukas (2018a), is itself divided into sound and broken plural (Al Ghadi, 1990/2014; Harrell, 1962; Heath, 1989, 2007). The second type we call ‘-at plural’, sometimes referred to as ‘special’ -at in this paper (Bensoukas, 2018a). We will explore each set separately. For simplification purposes and to acknowledge the works done by scholars on MA plurals, the ‘special’ -at plural is used to refer to pluralization described in the literature as sound plural (Harrell, 1962; Heath, 1989; Al Ghadi, 1990/ 2014). We will start by presenting the ‘special’ -at pluralization mode.

The -at plural is a special mode of pluralization in MA involving the suffixation of -at. Unlike the regular feminine sound plural -at suffix, this affix seems to behave differently. It attaches to the diminutives in both genders, masculine loan-nouns, plural-of-the-plural and nouns with the singular pattern *CCaC*, in addition to the names of months, regions as well as the letters of the alphabet (Harrell, 1962; Al Ghadi 1990/2014, Bensoukas 2018a). We provide illustrating examples below.

The first category using -at pluralization contains diminutives. The diminutive is formed in MA through the infixation of the segment [-i] after the second segment of the base. Normally, an input /*CCCVC*/, where V is a full vowel would have a diminutive singular /*CCiCəC*/ (e.g. *ktab*, *k^wtijəb*). Diminutives constitute the only derived masculine nouns which have corresponding plurals, all of which take the suffix [-at]. Not surprisingly, feminine diminutives also take -(a)t in the plural as shown in (6) below. The data in (6) also show that the glides *w* and *j* are usually used as C₂ and C₃ fillers in the template, respectively.

(6) <i>Masc.</i>			<i>Fem.</i>		
<i>Sg.</i>	<i>Pl.</i>	<i>Gloss</i>	<i>Sg.</i>	<i>Pl.</i>	<i>Gloss</i>
k ^w tijəb	k ^w tijbat	‘booklet’	mxidda	mxiddat	‘cushion’ dim.
kwijəs	kwijbat	‘glass’ dim.	wɾida	wɾidat	‘flower’ dim.

Similarly, nativized singular diminutive loan-nouns also take the *-at* suffix to form the plural, in analogy with native diminutive nouns, as illustrated in (7) below. Also, the glide *w* and *j* are epenthesized to fill the empty positions in the template.

(7) <i>Masc.</i>			<i>Fem.</i>		
<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>	<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
ʃwijək	ʃwijkat	‘hand bag’	ɬwibla	ɬwiblat	‘table’
dwisk	dwiskat	‘disk’	ʃnɪɖla	ʃnɪɖlat	‘sandal’
m ^w m ^w iɬəɾ	m ^w m ^w iɬɾat	‘motorbike’	ʒɾida	ʒɾidat	‘garden’

Some masculine loan-nouns also take the plural suffix *[-at]*. This category usually comprises loan-nouns which have not been assimilated into Arabic beyond the phonological stage, and hence fail to be analyzed into the MA tri- or quadrilateral C-root on a par with native nouns (Smeaton 1973, cited in Hafez 1996; Al Ghadi 1990/ 2014). Here again, *w* is epenthesized in the last two items in (8), which may perhaps be attributed to the stem-final vowel [u] in the singular (Bensoukas 2018a).

(8) <i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
tilifun <téléphone>	tilifunat	‘telephone’
ʔurdinaɬur <ordinateur>	ʔurdinaɬurat	‘computer’
kamju <camion>	kamjuwat	‘truck’
triku <tricot>	trikuwat	‘sweater’

Another category of nouns taking *-at* pluralization is the “plural of the plural”. The pattern “CCuCat” for instance, is used to express a great amount in the case of uncountable nouns as in “*zit/ zjutat* ‘lots of oil; too much oil’; *dhəb/ dhubat* ‘lots of gold; too much gold’” (Caubet, 2007:279). Similarly, Al Ghadi (1990/ 2014) described these nouns as having “an augmentative” meaning. Some examples are provided in (9) below.

(9)	<i>Sg.</i>	<i>Pl.</i>	<i>Pl. of pl.</i>	<i>Gl.</i>
	ʕərs	ʕras	ʕras-at	‘marriage ceremony (ies)’
	lhəm	lhūm	lhūm-at	‘meat (s)’
	ʃəmʃ	ʃmuʃ	ʃmuʃ-at	‘sun (s)’

All the singular nouns having the pattern CCaC take the *-at* plural suffix as in the examples below.

(10)	<i>S.</i>	<i>Pl.</i>	<i>Gl.</i>
	ʒwab	ʒwabat	‘answer’
	ʃwab	ʃwabāt	‘politeness’
	ʕlam	ʕlamat	‘flag’

As far as loans are concerned, some borrowings with the pattern CCaC in the singular show a similar behavior as native nouns with regard to their pluralization. They take the same *-at* suffix.

(11)	<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
	bʌn< plan>	bʌnat	‘plan’
	ʒwan< joint>	ʒwanat	‘spliff’
	kwan < coin >	kwanat	‘corner’

Feminine and masculine proper names, nouns of months, regions, as well as the letters of the alphabet form the plural through *-at* suffixation, as shown in (12i), (12ii), (12iii) and (12iv) below, respectively.

(12)	(i)	ʕli	ʕlij-at	
		Samira	samir-at	
	(ii)	rəmdan	rəmdan-at	‘Ramadan’
	(iii)	rbaṭ	rbaṭ-at	‘Rabat’
	(iv)	lif	lif-at	‘ʔalif’ (letter)
		nun	nun-at	‘nun’ (letter)

3.2. The sound / broken plural- loans

3.2.1. The sound plural

The sound plural in MA uses concatenative morphology (Al Ghadi 1990/ 2014; Heath, 2007). It involves the addition of one of the following suffixes *-in*, *-(a)t* or *-a* to a noun stem. The suffix *-in* is added to singular masculine nouns or adjectives, as in the case of *məsləm*, *msəlm-in* ‘Muslim’; or *fəṛḥan*, *fəṛḥan-in* ‘happy’ (Al Ghadi, 1990/ 2014). It is mostly added to adjectives, particularly to participles, to form the masculine plural. However, the suffix *-in* remains generally unproductive with nouns (Heath, 1989).

The suffix *-at*, on the other hand, is generally used in MA as a feminine plural affix (Harrell, 1962; Al Ghadi, 1990/2014). It occurs with nouns and rarely with adjectives. Stems ending in *-a* take *-t* as in *ʕəmma*, *ʕəmma-t* ‘a paternal aunt’; *təbsima*, *təbsimat* ‘a smile’.

It is worth noting that despite the predictability of the sound plural based on gender and other grammatical information, it is not the regular mode of pluralization (McCarthy & Prince, 1990: 212). In the following section we will shed light on some of the most common patterns of BP in MA.

3.2.2. The broken plural

The broken plural, on the other hand, is formed through internal modification of the base (Al Ghadi, 1990/2014; McCarthy & Prince, 1990; Ratcliffe, 1998; Heath, 1987, 1989, 2002; Caubet, 2007, Bensoukas 2018b). The patterns of the broken plural in MA are formed in different ways. Al Ghadi (1990/2014) suggests four major and six minor BP patterns. The major patterns include CCVC, CCaCC, CCajəC, and CCaCa. A few illustrating examples are presented in the tables below from native as well as loan nouns. The first set is composed of quadrilateral nouns.

(13) CCaCC

	<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
(i)	fəndəq	fnadəq	‘hotel’
	qəntṛa	qnaṭər	‘bridge’
	yərbal	yṛabəl	‘sieve’
(ii)	bərrad	brarəd	‘tea pot’
	ʃəṭṭaba	ʃṭaṭəb	‘broom’

(iii)	xatəm	xwatəm	‘ring’
	ħazəb	ħwazəb	‘eyebrow’
(iv)	məħna	mħajən	‘ordeal’
	şəŋfa	şħajəf	‘profession’

It is noticed that in some of the quadrilateral forms that have the feminine morpheme -a, the latter is omitted in the plural. This omission can perhaps be explained by the presence of four full segments within the stem, preceding the stem-final vowel (Heath, 1987: 108-109).

Unlike the forms in (13i) which are composed of “real” quadrilaterals (four full segments), the two items in (13ii) acquire their quadrilateral status through the gemination of the second consonant of the root. The geminates are separated in the plural after the insertion of the ablaut vowel. The forms in (13iii) and (13iv) are trilateral. The glides *w* and *j* are thus inserted, respectively, to fill the fourth empty slot in the template.

(14) *Loanwords of the pattern CCaCC*

	<i>Sg.</i>		<i>Pl.</i>		<i>Gl.</i>
(i)	şəlquṭ	<sale gosse>	şlagəṭ		‘naughty kid’
	şəŋdala	<sandale>	şħadəl		‘sandal’
(ii)	şəbbəṭ	<zapato>	şħabəṭ		‘shoe’
	bərraka	<baraque>	brarək		‘hovel’
(iii)	kaḍər	<cadre>	kwadər		‘frame’
	karṭa	<carte>	kwaṛəṭ		‘card’
	gamila	<gamelle>	gwaməl		‘cooking pot’
	karṭuna	<carton>	kṛaṭən		‘carton’
	maḷiṭa	<malette>	m ^w m ^w aḷəṭ		‘briefcase’
	giṭun	<guitoune>	gjaṭən		‘tent’
(iv)	blaşa	<place>	blajəş		‘place’
	blaka	<plaque>	blajək		‘plaque’
	ksida	<accident>	ksajəd		‘accident’

The loan-nouns in (14) show the same behavior as their corresponding native ones in (13) above. The items in (14i) are ‘real’ quadrilaterals fitting perfectly in the plural template. Similarly, in (14ii), the loan forms display medial consonant gemination, split in the plural.

The data sets (14iii) and (14iv) are interesting. It is noticed that except from the item *kaḍəʔ* ‘frame’, which has the same singular pattern *CaC(ə)C* as *xatəm* ‘ring’, the remaining forms show a different shape. In addition to the stem consonants, they contain two or three full vowels in the singular base. The difference in shape can probably be explained by the fact that these loans show a maximal preservation of the structure of the source language by maintaining the stem vowels. Additionally, the feminine morpheme [a] is concatenated to mark feminine gender.

(15) *CCVC*

<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
ʒməl	ʒmal	‘camel’
nəʒma	nʒum	‘star’
ʕəbd	ʕbid	‘slave’

The plural of the above nouns, both masculine and feminine, is formed through the infixation of the vowels a, u or i after the first two consonants. It is noticed that the feminine suffix *-a* disappears in the plural in the same way as in the above-mentioned examples in (15). We could not identify any loanwords corresponding to the *CCvC* pattern.

The items in (16) are trilateral forms. They form the plural in a straightforward way following the ablaut pattern *CCaCa*. A similar pattern is also attested in loanwords, illustrated in (17):

(16) *CCaCa*

<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
fərdi	frada	‘gun’
kursi	krasa	‘chair’

(17) *Loanwords of the pattern CCaCa*

<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
ḍuʃi<dossier>	ḍwaʃa	‘folder’
kuri<écurie>	kwara	‘stable’

The loan nouns show a slightly different behavior. The singular forms are di-consonantal, hence necessitating the epenthesis of the semi-vowel *w* to satisfy templatic constraints.

3.2.3. Double pluralization

One interesting phenomenon characterizing some loan-nouns is the possibility of double pluralization. This variation is manifested in cases where the plural of a loan-noun is realized in two different ways involving both concatenative and nonconcatenative plural modes. In addition to the BP, the nouns below take the plural affix *-at*, yet the affix does not denote the feminine as the nouns maintain their masculine gender.

(18)	<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
(i)	kaḍər <cadre>	kaḍrat / kwaḍər	‘frame’
	muṭur <moto>	muṭurat / m ^w m ^w aṭər	‘motor bike’
	risibu <recibo>	risibuwat / rwasəb	‘receipt’
	giṭun <guitoune>	giṭunat / gjaṭən	‘tent’
(ii)	ḍuṣi <dossier>	ḍuṣijat / ḍwaṣa	‘folder/ file’
	kuri <écurie>	kurijat / kwara	‘stable’
(iii)	zərḍa <jardín>	zərḍat / zraḍi	‘garden’
	nəmra <numero>	nəmrat/nwamər	‘number’
(iv)	film <film>	filmat/ lʔaflam	‘film’

The items in (18) display variation where the loan-nouns happen to take both the *-at* plural and the broken plural. Similarly, there are some feminine loan-nouns which take both the broken plural and *-at* plural as in the following examples:

(19)	<i>Sg.</i>	<i>Pl.</i>	<i>Gl.</i>
	brwiṭa <brouette>	bərwiṭat / brawəṭ	‘wheel-barrow’
	kaṣiṭa <cassette>	kaṣiṭat / kwasəṭ	‘tape’
	karṭa <carte>	karṭat/ kwarəṭ	‘card’
	laṃḃa <lampara>	laṃḃat/ lwaṇəḃ ⁷	‘light bulb’
	zaṇṭa <jante>	zaṇṭat/ zwaṇəṭ	‘rim’

⁷ It is noticed that /m/ changes into /n/ in the BP *laṃḃa/ lwaṇəḃ* ‘lamp’, while the /m/ is maintained with *-at* plural ‘laṃḃat’. This change is triggered by the phonotactic constraints of MA. While /n/ may precede stops, the sequence /mb/ or /bm/ is not allowed within a stem in the language. According to Heath (1987:211), this might be motivated by a constraint banning ‘adjacent non-identical labials’ from occurring. The sequence /mb/ is permitted though in *laṃḃat* ‘lamp’, since the sequence occurs at morpheme boundaries, and not within the stem as is the case in ‘*lwaṇəḃ*’ above.

This plural variation is highly revealing with regard to the base of derivation in MA. In the case of the concatenative *-at* plural, it is clear that the plural suffix is attached to a base stem. The nonconcatenative BP, on the other hand, involves the combination of a consonantal root with a BP pattern. These facts bring insight into the lexical organization of the language, as will thoroughly be shown in the next section.

4. Lexical organization in MA

The organization of the Semitic lexicon has been the subject of heated debates in the literature. The role and nature of the input base constitute the major source of controversy. While some scholars claim that consonantal roots characterize the base of derivation, others defend the stem-based approach to word formation. Both approaches are reviewed thoroughly in the next section.

4.1 Root-based and stem/word-based approaches to Semitic morphology

Lexical organization has been a long-standing issue in Semitic morphology. There is a controversy about the morphemic status of the consonantal root (C-root) in the literature on Semitic languages. In his seminal work, Cantineau (1950:120) described the notion of the root in Semitic languages as the shared radical among a group of interrelated words. For instance, the words *qatala* ‘he killed’, *qatl* ‘murder’, and *qa:til* ‘killer’ have a common root \sqrt{qtl} . McCarthy (1981) has advanced the theory of Non-Concatenative Morphology (NCM), within generative linguistics, whereby the word is represented on separate tiers: the root tier, the vocalic tier and the template (CV) tier. Words are formed through the interleaving of vowels between the consonants of the root. In Arabic, the typical example of the root \sqrt{ktb} carries the meaning of ‘writing’, from which other related words are derived based on existing patterns. Forms such as *kita:b* ‘book’, *maktu:b* ‘written’, *ka:tib* ‘writer’ and *maktab* ‘office’ are generated from the root \sqrt{ktb} .

Supporters of the C-root approach argue for its lexical status (Prunet, Béland and Idrissi, 2000; Davis & Zawaydeh, 1999, 2001; Ziani, 2018, see Prunet, 2006 for a review). Prunet, Béland and Idrissi, (2000) provide external evidence from metathesis errors of an Arabic-French bilingual aphasic (ZT) for the existence of abstract roots in the mental lexicon.

The metathesis errors were identified at the level of the root consonants only, excluding any other segments be they vowels or affixal consonants. In the same vein, Davis and Zawaydeh (1999, 2001) describe patterns of hypocoristics (nicknames) in Jordanian Arabic. The study reveals that the hypocoristic formations make reference to the C-root, apart from vowels and affixal consonants.

This traditional view of the root has been challenged by many scholars who argue that a stem-based approach characterizes lexical organization in a better way (Heath, 1987; Bat-El 1994; Ratcliffe, 1997; Ussishkin, 1999; Boudlal 2018; Bensoukas 2018b; El Hamdi 2018 among others). Bat-El (1994) and Ussishkin (1999) have both examined Modern Hebrew denominative verb formation. Bat-El dispenses with the C-root and claims that it is not referenced at any stage of the derivation. Instead, she adopts the Stem Modification model holding that it accounts for the transfer of clusters, necessary for the derivation of Hebrew denominatives.

A third category of scholars suggests a combination of both root-based and stem-based word formation (Watson, 2006; Ravid, 2006). Watson (2006) argues that the analysis of San'ani Arabic diminutive and non-diminutive counterparts on the basis of semantic and phonological relationships between the two categories has revealed that both root-based and stem-based types of word formation exist in the language. Similarly, Ravid (2006) provides evidence from Hebrew nominal morphology showing that the Hebrew lexicon is organized around two different systems of morphological formation: the first one is a non-linear root and pattern model, having the root as the basic lexical component. The second is a linear stem-and-suffix structure, having the stem as the core lexical component of words.

The present paper supports the view calling for a combination of both root and stem-based models. It argues, based on loanword morphology, that both a root-based and a stem-based word formation models characterize the MA lexicon. Hence, it contributes to the on-going debate on the base of derivation in Semitic morphology. While some derivational processes take the root as the basic morphological unit, other morphological phenomena can only be accounted for by derivation from a fully vocalized stem. We claim that while backformation supports the C-root as a base of derivation, French loan infinitives call for a stem-based approach to MA. Loan pluralization, on its part, provides evidence for both approaches, the sound and 'special' *-at* plural being stem-based and the broken plural root-based as we show below.

Evidence for the lexical status of the C-root comes from backformation in loanwords. This process consists in the extraction of a C-root from integrated loan-nouns, excluding vowels, which then productively serves as a base of derivation of new morphological categories. After extraction of the C-root via backformation, it has been shown that the derivation of the medio-passive, the passive participle and the deverbal noun took place in the same fashion as in MA native words, through the inter-digitation of the root with the native vocalic patterns (e.g. $\sqrt{\text{sf}3}$, *t-sufi3* ‘savage’ on the pattern CCuCiC). This example is reminiscent of McCarthy’s (1981) multi-tiered model where the C-root is underlyingly represented on a separate tier. These facts confirm the existence of a C-root as an abstract unit in the mental lexicon and reiterate its significant role in word formation in MA.

French loan infinitive perfective morphology, on the other hand, shows that once integrated, these verbs show a similar morphological behavior to native verbs. They display the same [a]-[i] vowel ablaut of [-i] final verbs in MA in the perfective. A case in point is the loan-verb *frani*, *frana* ‘brake’ in analogy with native *mfi*, *mfa* ‘go’. The form *frani* shows that the input to which the morphology has access is a form that contains a final vowel [i], adapted from French [e]. In this case, we can conclude that the base of derivation is a verb with a vowel ending. As such, French loan infinitives call for characterizing the base of derivation not as a C-root but as a stem instead.

Loanword pluralization, on its part, expresses morphological organization in two different ways: one based on the root and the other on the stem. First, the broken plural is formed through the mapping of a C-root to a BP pattern. A loan-noun like *ṣəṇḍaḷa* ‘sandal’ takes the BP *ṣṇaḍəl* following the native quadrilateral BP pattern CCaCC, in analogy with forms such as *qəṇṭra* ‘bridge’, *qṇaṭər*. This is achieved through the mapping of the four root consonants of the singular onto the corresponding plural template. Such a conception supports the autosegmental analysis of Semitic root consonants proposed in McCarthy (1981). Hence, the BP definitely supports a root-based approach. Second, the ‘special-at’ plural involves suffixation of the affix *-at* to a noun-base. For instance, the loan noun *tilifun* ‘phone’ takes the plural form *tilifun-at*. It is noticed that, in the process of plural formation, the base form did not undergo any changes and remained intact. Also, it is clear that the loan form displays a different shape compared to native nouns (tri-syllabic status, full vowel syllabification). This structural difference reveals the degree of integration of loanwords. We have mentioned earlier that ‘unassimilated loans’ preserve the

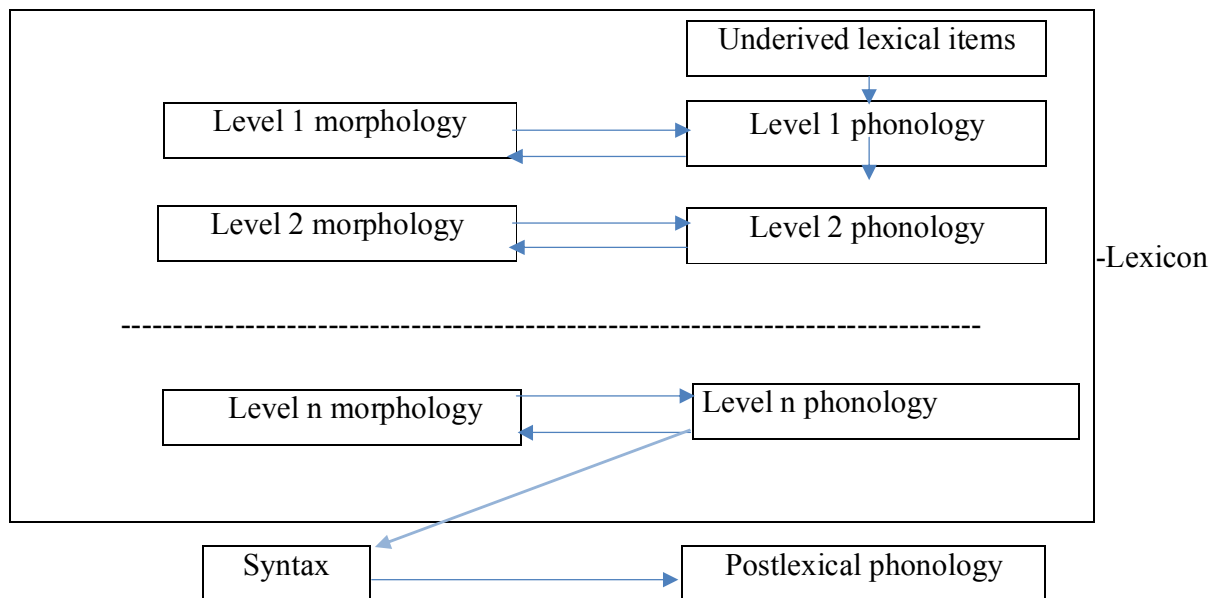
structure of the source language and take the ‘special’ *-at* plural. These forms fail to be analyzed into roots. Hence, we cannot claim the C-root as a base for their derivation.

To recapitulate, the study of loanword morphology beyond integration is highly revealing, showing that the lexical organization of MA is characterized by both the C-root and the stem as a base of derivation. The next section provides further insight into the organization of the lexicon by offering a stratification model of the language.

4.2 Lexical stratification

The basic idea of lexical stratification or level-ordered morphology is that the lexicon is organized in a series of hierarchical strata or levels where phonological and morphological rules interact cyclically (Siegel, 1974; Allen, 1978; Mohanan, 1982; Kiparsky, 1982b, 2015, Itô and Mester, 1999; Giegerich, 1999; Bermudez-Otero, 2018). Cyclicity implies that phonological rules apply in the lexicon after every morphological operation, and that the output of the phonological process then becomes the input to further morphological operations (Mohan, 1982:14-15). The lexicon consists of ordered lexical strata which function as the domains of application for these phonological and morphological rules as illustrated in (20).

(20) The stratification model of English:



(Adapted from Kiparsky, 1982b)

As far as the Arabic lexicon is concerned, a two-level stratification is proposed, the stem stratum and the word one (Kiparsky, 1982b; Ratcliffe, 1998). While level-1 processes apply generally with nonconcatenative or infixal morphology, level-2 processes involve concatenative morphology, such as prefixation or suffixation to a word stem (Watson, 2002: 132,173). Explaining this two-level stratification further, Levy (1971: 22-31) examines the case of pluralization in Classical Arabic. She holds that the plurals of the underived base noun are ‘regularly’ and ‘productively’ derived at level-1, thus taking the broken plural. The derived nouns, on the other hand, including participles, diminutives, and verbal nouns, undergo level-2 sound pluralization. Similarly, in his comparative study of Moroccan Amazigh (AM) and Moroccan Arabic (MA) pluralization systems, Bensoukas (2018b:75) proposes a similar organization of AM and MA lexicons. He assigns the broken plural to level-1, the sound plural to level-2. However, unlike Levy (1971), he argues that the class of nouns including loans, diminutives, and plural of the plural, among others, are not assigned to level 2. The scholar claims, following Zwicky and Pullum (1987), that these nouns call for a special type of morphology, namely extragrammatical morphology⁸, as opposed to plain morphology. Accordingly, Bensoukas (2018a) suggests a third level, the “extragrammatical”, containing all other forms not taking the common (non-) concatenative plural mode (i.e. taking the Amazigh *-id* and Arabic *-at* plural affixes).

We will adopt the same lexical stratification model proposed by Bensoukas (2018a:75), with minor modifications to accommodate data from loanwords.

⁸ There is a distinction in the literature between grammatical and extragrammatical morphology. There is a set of principles which sets extragrammatical morphology apart from plain morphology (see Zwicky and Pullum 1987, Dressler and Merlini Barbaresi 1994, and references therein). However, other scholars oppose the aforementioned distinction, claiming that the ‘properties characterizing extragrammatical morphology can be found also in grammatical morphology’ (Bat-El, 2000: 1). (See Bat-El, 2000 for a detailed account).

(21)	<i>Lexicon</i>	
	Non-concatenative (native nouns + integrated loans)	
Level I	<i>ṣəṇḍala</i> → <i>ṣṇaḍəl</i> ‘sandal’	(<i>Broken plurals</i>)
	<i>kaḍər</i> → <i>kwaḍər</i> ‘frame’	
<hr/>		
	Concatenative (native nouns)	
Level II	MA: (masc.) <i>muṣəllim</i> → <i>muṣəllimin</i> ‘teacher masc.’	(<i>Sound plurals</i>)
	(fem.) <i>muṣəllima</i> → <i>muṣəllimat</i> ‘teacher fem.’	
<hr/>		
	Exagrammatical (native + semi-/ unintegrated loans)	
Level III	<i>tilifun</i> → <i>tilifun-at</i> ‘telephone’	
	<i>kaḍər</i> → <i>kaḍr-at</i> ‘frame’	(<i>at-plurals</i>)
	<i>Surface word</i>	

We assume along the lines proposed by Bensoukas (2018a) that MA lexicon is organized into three strata: the non-concatenative, the concatenative and the exagrammatical, respectively. The claim is that loan pluralization cannot only probe the stratification of the lexicon but may also provide an insight into the status of the C-root as a base of derivation in MA. ‘The non-concatenative’ stratum comprises the native forms as well as the integrated loans. Nouns on this stratum take the broken plural, generally through the interdigitation of roots with different plural patterns. It, thus, supports a root-based account to morphology; the second stratum ‘the concatenative’ hosts the “normal” sound plurals. Forms on this stratum are generally feminine native bases to which the SP affix is attached. As the base remains intact, a stem-based model is preconized. The third and last stratum, ‘the exagrammatical’, is the site for the “special”-*at* plurals, both native (e.g. diminutives) and semi/ unintegrated loans. Similar to the second stratum, since it involves suffixation to a noun stem, it calls for a stem-based characterization of the base.

One interesting contribution of this stratification model is that it captures loan plural variation. For instance, the loan-noun *kaḍər* ‘frame’ takes both plural forms *kwaḍər* and *kaḍr-at*. The phenomenon of double pluralization is clearly displayed in the schema through the assignment of the forms *kaḍər/ kwaḍər* and *kaḍər/ kaḍr-at* to both the first and third strata, respectively. The use of the BP *kwaḍər* reveals that the loan-noun *kaḍər* is fully integrated in MA. As such, it conforms to the phonological and morphological systems of the language.

Another significant addition of this model is that it can be used to come up with a comprehensive stratification of MA lexicon based on loanword data. In other words, this model seems to be extended to the other components of loan morphology, namely backformation and French infinitives. In this respect, in addition to hosting the native forms and the root-based BP nouns, the first stratum (the non-concatenative) could also integrate backformation derivations. The second stratum (the concatenative) which hosts stem-based operations, accommodates the integrated French infinitives together with the previously mentioned sound plurals. The third stratum the ‘extragrammatical’, comprises all the stem-based forms which ‘lie outside the domain orthogonal to the grammar’ (Zwicky and Pullum, 1987:9), including diminutives and semi-/unintegrated loans. Accordingly, the examined morphological aspects pertaining to loanwords after integration brought more insight into the organization of the MA lexicon. It is apparent that the MA lexicon is organized around both a consonantal root and a stem.

5. Conclusion

This paper has attempted to bring an insight into lexical organization in MA. It has examined the behavior of loanwords beyond integration. Particularly, we have looked at different morphological processes including backformation, French loan-infinitives as well as loan pluralization. We have shown that backformation through root extraction in MA provides evidence for a C-root approach. Conversely, the integrated infinitives challenge this C-root view supporting the stem-based model. Data from loan pluralization has revealed that both the C-root and the stem are attested. While the BP lends support for the C-root, the ‘special’-*at* plural provides convincing evidence for a stem-based model. In sum, these factors call for a hybrid approach reconciling both root-based and stem-based approaches in MA. This position was further reinforced by the stratification model we proposed for loan plurals.

This work has examined the behavior of loanwords beyond integration in MA. However, it did not provide a formal analysis of the different issues discussed. A constraint-based model such as Optimality Theory (OT) can offer a neat analysis of the morphological phenomena at hand. Another interesting point raised by an anonymous reviewer of the present work concerns a crosslinguistic overview of the morphology of loanwords after integration. It is worth investigating whether there are languages, Semitic or other, that display the same array of lexical

organization issues. Due to time constraints, this issue and the OT analysis are left for future research.

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