

Gradual Integration of Moroccan Arabic Loanwords in Ayt Souab Tashlhit

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Résumé

Le présent article propose un processus, en trois niveaux, pour l'intégration des emprunts de l'arabe marocain dans la variante tachelhite d'Ayt Souab. Cette hiérarchisation est basée sur le degré et la prédictibilité des changements que ces emprunts subissent. Les emprunts non-intégrés ont tendance à maintenir leurs structures segmentale et syllabique dans la langue d'accueil. Les emprunts partiellement intégrés subissent des mutations qui se limitent à leur composante vocalique. Ces changements sont prédictibles dans la mesure où ils visent essentiellement à satisfaire la structure prosodique de la langue d'accueil. Les emprunts totalement intégrés sont sujets à des changements radicaux qui affectent leur composante consonantique et vocalique, au point qu'il est parfois difficile d'établir une relation systématique entre la forme de surface et la forme sous-jacente. Ces différents niveaux d'intégration sont analysés dans le cadre de la théorie des contraintes et stratégies de réparation élaborée dans la phonologie des emprunts.

Amazigh has, throughout its history, been in contact with many languages such as Punic, Latin, Arabic and, more recently, French. Obviously, the impact of this contact situation is still present in Amazigh, and mostly manifested in loanwords. Long-term and very close contact between Amazigh and Arabic has resulted in mutual influence manifested by the transfer in both directions of not only lexical items but also phonological and morphological properties. More specifically, the structure of Arabic loanwords used in Amazigh provides interesting traces of this long term contact in the sense that these words integrate in different degrees into the phonological system of Amazigh.

The present article investigates the process of integration of Moroccan Arabic (MA) loanwords mainly in the variety of Tashlhit spoken in Ayt Souab (middle of Anti Atlas). We will argue for a gradual adaptation of these loan items in the phonological system of Ayt Souab Tashlhit (henceforth AST). The process follows a scale going from full preservation of the original segmental constituency of the loan to a non-predictable alternation affecting both its consonantal and vocalic components, and thus its syllable structure (cf. Boukous, 1986, Marouane, 1997). We have therefore classified Moroccan Arabic, (hereinafter MA), loanwords, based on the degree of their integration into the target phonological system, into three categories, viz. the non-integrated loans which have maintained their MA form, such as *xali* 'uncle', the semi-integrated (1st degree integrated) loans which have

only their vocalic component affected by alternation, like *ləbzar* > *labzar*, and the fully-integrated (2nd degree integrated) loans which have undergone both vocalic and consonantal components change, as in *fəlfla* > *ififl* ‘pepper’.

We will also argue that most of the alternations affect the vocalic component of the loan items rather than the consonantal structure, and these consist of processes inserting, deleting, reducing or strengthening a vowel. Deletion processes are very limited and less common than epenthesis. This tendency goes along with the theoretical prediction that loanwords ill-formedness is remedied by insertion rather than deletion alternations proposed by the Theory of Constraints and Repair Strategies (TCRS) elaborated by Paradis, Lebel & LaCharité (1993) and Paradis (1996). In the course of analysis, we will see whether the mechanisms of this theory, namely the Preservation and the Minimality Principles, can provide an adequate account of the different alternations affecting the segmental and syllable structures of MA loans in their integration into the AST phonological structure.

In the remaining sections of the present article, we will first motivate the classification of MA loanwords into three categories. We will discuss the main alternations undergone by the segmental and syllabic structures of the first category, i.e. the non-integrated loans. We will afterwards address the morphologically and phonologically motivated changes occurring in the semi-integrated loans. The non-systematic processes exhibited by the third category, i.e. the fully integrated loans, are also investigated. In the last section of this paper, we will attempt to provide a principled account for these alternations within loanword phonology by adopting the Theory of Constraints and Repair Strategies.

1. Degrees of Integration of MA Loanwords

MA loanword segmental and syllable structures are not homogeneous by virtue of the fact that they react differently to the process of integration into the AST phonological system. The need to classify MA loanwords according to their degree of integration into categories is thus motivated by certain considerations on which the study is based. First, a preliminary examination of the structure of a sample set of 332 MA loan items reveals that 25, 11% of these do not undergo any change, and that about 69% of them undergo a relatively predictable change, while a limited number of these items, i.e. 5, 5%, are subject to unpredictable alternations. Second, we have found out that, within the set of items undergoing change, certain alternations affect a limited number of segments and occur in defined environments, while others are rather sporadic and are not systematic. Third, it is also attested that the most frequent alternations affect mainly the vocalic components of loan items while the non-systematic alternations affect rather consonants. We have thus deduced that MA loanwords undergo a gradual process of prosodic integration in the AST phonological system, and can accordingly be classified into three categories: the non-integrated, the semi-integrated and the fully integrated loans. In what follows we will investigate certain aspects characterising these three categories of loanwords.

1.1. Non-integrated loans

The loan items which have maintained their segmental and thus their syllable structures represent almost one fourth of the sample loan list. Given the stability of the structure of this category of loans, the utility of its investigation may seem very limited. It would, nonetheless, be fruitful to find out whether or not there is any phonological explanation to this phenomenon of structure preservation.

We will see that indeed this category has certain salient characteristics which distinguish it from the other categories. Most of the items of this category belong to certain formal lexical registers used in restricted formal situations. They, in fact, originate from either Middle Moroccan Arabic (MMA) or French. They also display a simple syllable structure with characteristics tolerated by the AST's prosodic system. Their segmental and syllable structures do not violate the constraints and mechanisms operating in AST.

Segmental Structure

The basic motivation for the maintenance of the segmental structure of this category of loanwords should be the fact that both MA and AST do in fact share basically the same segmental inventory. Consider the following items.

(1)

a.	MA	AST	Gloss
	lqanun	lqanun	'law'
	lmasira	lmasira	'march'
	ssuʕal	ssuʕal	'question'
	lmuntaxab	lmuntaxab	'team'
	lbaladiyya	lbaladiyya	'municipality'
	ddustur	ddustur	'constitution'
	lmimsaħa	lmimsaħa	'eraser'
b.	lmida	lmida	'table'
	lkisan	lkisan	'glasses'
	xali	xali	'maternal uncle'
	lustad	lustad	'teacher'
	ssəllum	ssəllum	'ladder'
	nnamusiyya	nnamusiyya	'bed'

c.

ṭṭabla	ṭṭabla	‘table’
sstilu	sstilu	‘pen’
ṭṭubis	ṭṭubis	‘bus’
lmuṇaḍa	lmuṇaḍa	‘lemonade’

The items in (1a) represent a formal register used in Middle Moroccan Arabic. Forms such as *lmasira* originate from CA *almasi:ra* ‘march’. The items in (1c) undergo changes in their passage from French to MA. The forms in (1b) are rather less formal items.

The forms in (1c) originate from French and they transited by MA in their passage to Tashlhit. This finds support in the fact that these loanwords have adopted MA inflection morphology. Similarly, these forms have undergone many alternations in their passage from French to MA. The forms such as *ṭṭubis* and *lmuṇaḍa* originate from /otobus/ and /limonad/ respectively.

Most of these loan items maintain even their inflection when borrowed to AST. We consider herein the plural and feminine inflection. The plural form of *lmasira* is *lmasirat* in both MA and Tashlhit which entails that the MA plural morpheme is maintained under borrowing. Consider more plural items in the following list:

(2)

i- MA	ii-AST	Gloss
lqawanin	lqawanin	‘laws’
lmasirat	lmasirat	‘marches’
lkisan	lkisan	‘cups’
lmwayd	lmwayd	‘tables’
lasatida	lasatida	‘teachers’
ṭṭbali	ṭṭbali	‘tables’
sstiluwat	sstiluwat	‘pens’
ṭṭubisat	ṭṭubisat	‘buses’

The items above (in 2ii) are supposed to take the Amazigh plural morpheme given that inflection morphology is generally not sensitive to borrowing. Hence the plural Amazigh form of an item such as *lmasira* would be **tilmasiratin* in analogy with *tazalimt* >> *tizalimin* ‘onions’. Yet, certain items in (1) take an AST plural morpheme. The plural form of *xali* ‘maternal uncle’ and *emmi* ‘paternal uncle’ in AST is *idxali* and *idemmi* respectively, and not *xwali* and *emmi* as in MA.

The same thing holds for the feminine inflection, i.e. [-a] suffix, which tends to be borrowed with certain of the non-integrated loans. Consider the following examples:

(3)

MA	AST	Gloss
lustada	lustada	‘teacher (fem.)’
xalti	xalti	‘maternal aunt’
εəmti	emti	‘paternal aunt’

Yet, other forms tend to drop the MA feminine morpheme and adopt the Amazigh morpheme instead. The AST feminine morpheme of the MA form *tbib* ‘doctor’ is *taḍbibt* rather than *tbiba* as in MA. Consider more instances of loans which do not maintain the MA feminine morpheme.

(4)

MA	AST	Gloss
lluḥa	talluḥt	‘slate/writing tablet’
lkuḥa	takurt	‘ball’
lfahima	talfahimt	‘wise woman’
lkatiba	talkatibt	‘typist (fem.)’

The forms above drop the suffix [-a] which stands as the MA feminine inflection; they take the productive Amazigh feminine morpheme [t--t]. Therefore, the item /lluḥa / enters AST as l-lluḥ -a. The MA feminine suffix [-a] is detected and deleted and later on replaced by the Amazigh feminine morpheme, thus surfacing as [ta-l-luḥt]. The MA definite article [l-] is, however, maintained¹. This proves that AST adjustment mechanisms have access not only to segmental and prosodic structures but also to the morphological constituency of loanwords input forms.

We have seen that the category of loanwords examined above maintains its input segmental structure. This is due, in addition to the fact that MA and AST share basically the same segmental inventory, to the formal lexical categories to which they belong and to their MMA and French origins.

We can conclude then that this category of loanwords does not show signs of integration given that they preserve both their input segmental and syllable structures. In the following section, we will delineate the main characteristics of the segmental and syllable structures of the semi-integrated loans.

1.2. Semi-integrated Loans

The most salient aspect characterising the present category of loan items is that, unlike the first category, they do not maintain their MA input form and that they undergo relatively predictable alternations. The latter affects mainly the vocalic

¹ The MA definite article [l-] seems to be opaque to the AST adjustment rules, in the sense that it is maintained in most borrowed noun forms considered in this work. More than that, all the borrowed nouns in AST in fact contain the definite article, morphological system of the target language makes no distinction between definite and indefinite MA nouns. For instance, the MA nouns *mida* ‘table’, *kursi* ‘chair’, *səllum* ‘ladder’ would never surface as such in AST, but rather as *lmida*, *lkursi*, and *ssllum*.

component, and thus the syllable structure of the borrowed items. These alternations are grouped according to whether they are morphologically or phonologically induced.

1.2.1. the Segmental Structure

The alternations undergone by this category of MA loans consist of relatively predictable processes affecting mainly their vocalic structure. The processes integrating these loans into AST tend to insert vowels, strengthen schwas into full vowels, or to a less extent delete vowels. Some of these alternations are morphologically induced, namely the insertion of the state marker /a-/ and the substitution of the MA feminine morpheme. The other processes are purely phonological, and involve mainly full vowel epenthesis and schwa strengthening.

1.2.2. Morphologically Induced Alternations

Certain segmental changes are motivated by the morphological integration of MA loanwords into the AST morphological system. This consists in replacing MA affixes by their equivalents in AST. We consider herein two productive processes having an ostensible effect on the prosodic structure of the borrowing variety, namely the prefixation of the Amazigh state marker, and the feminine inflection. We start with considering the loan items which acquire an initial vowel [a] in AST, as is illustrated by the items below.

(5)

MA	AST	Gloss
bəqqal	abqqal	‘grocer’
gəzzar	agzzar	‘butcher’
fərmlɪ	afrmlɪ	‘nurse’
kəmmay	akmmay	‘smoker’
ɣ ^w əɾɾaf	aɣ ^w ɾɾaf	‘big cup’
buzadi	abuzadi	‘naïve’
kuzani	akuzani	‘a cook’
grisun	agrisun	‘driver assistant’

The passage of the items in (5) from MA to AST triggers a process prefixing a vowel /a/, a state marker, to bring them in line with typical Amazigh nouns in the free state form. In fact, most singular Amazigh nouns begin with an [a-], marker of the free state, e.g. in *afus* ‘hand’, *amalu* ‘shadow’. This vowel prefixation results in the creation of a new syllable and the deletion of the vowel of the initial syllable in the MA item, and thus in the redistribution of segments into a new syllable structure. Thus, $\gamma^w \text{ } \text{r.raf}$ becomes *a* $\gamma^w \text{ } \text{rraf}$ ‘big cup’ and *g z.zar* becomes *agz.zar* ‘butcher’, while *gri.sun* turns into *ag.ri.sun* ‘driver assistant’. This process of vowel prefixation is very productive and affects a wide set of nominal loans

including newly borrowed nouns such as *ṣuwwar* >> *aṣwwar* 'photographer', *ṣaḥafī* >> *aṣaḥafī* 'journalist'. Even certain MA nouns beginning with the definite article /l/, which represent an exception to this process², take the initial vowel /a/ viz. *kunnaš* > *alkunnaš* 'copybook', *kumir* > *alkumir* 'long loaf of bread'.

Further support for the genuine status of this initial vowel as a component of the Tashlhit noun comes from a mirror image process undergone by certain items borrowed by MA. The items drop the Amazigh state marker viz. the initial [a-], when integrated into the MA phonological system. Consider the following MA items of Amazigh origin.

(6)

Amazigh	MA	Gloss
amzgur	məzɡur	'corn'
arqqas	rəqqas	'messenger /postman'
amzwaru	məzwar	'first'
agnaw	gnawi	'dumb'

This productive process deletes the state marker of the Amazigh nouns borrowed by MA except for the case of certain Amazigh toponyms such as *azru* and *agadir*³. This stands as evidence for the fact that the initial /a/ is an important component of the morphological identity of Tashlhit nouns.

Similarly, MA feminine nouns tend to drop the final vowel /a/ and replace it with /t/, which marks the feminine, in the course of their integration into the AST morphological system. Consider the following items.

(7)

MA	AST	Gloss
ssaəa	ssaət	'time/watch'
ssfina	ssfint	'boat'
q ^w əbba	lqubbt	'dome'
ləmdina	ləmdint	'city'
lmuna	lmunt	'supplies'

In items in (7) above, the MA feminine suffix [-a] is deleted and replaced by the suffix [-t], the Amazigh feminine marker, when the loans are used in AST⁴. Despite

² For instance, the nouns beginning with the definite article /l/ such as [lmizan] 'balance/weighing scale' and [lkuRsi] do not undergo /a/ prefixation.

³ In the case of the item [agadir], we personally attested that certain MA speakers articulated it as [gadir] with no initial [a-].

⁴ A limited set of feminine forms tends to take the integral Amazigh feminine morpheme [t--t] viz. lfanida > talfanitt 'sweet', lkumira > talkumirt 'loaf of bread'.

its morphological status, this process has a systematic effect on the prosodic structure of these loans, in the sense that vowel deletion results in the reduction of the number of syllables. Most items in (7) above are reduced to monosyllabic words.

In what follows we will look at the items undergoing phonologically motivated alternations.

1.2.3. Phonologically Motivated Alternations

MA loanwords are subject to other changes which are motivated by the need to abide by the AST prosodic structure, in the sense that they target specific syllable position, thus generating well-formed syllable patterns. These involve mainly schwa strengthening, full vowel epenthesis, and consonant gemination.

In words borrowed from MA where the first vowel is a schwa, there is a tendency for the schwa vowel to become a full vowel. Consider the following examples:

(8)

MA	AST	Gloss
lməqla	lmaqla	‘frying pan’
ṭṭeyyeb	ṭṭayyib	‘proper name’
ṣṣndala	ṣṣandala	‘sandals’
ləx ^w bar	lax ^w bar	‘news’
ləbzar	labzar	‘spice’
ddənya	ddunit	‘life’

The schwa vowel occurring in the MA loans in (8) above, such as *ləx^wbar* and *lməqla* turns into a full vowel, viz. *lax^wbar* and *lmaqla* respectively. This process is a case of schwa strengthening which enhances the feature content of the reduced vowel by acquiring the features [-high], and [+back]. The rule accounting for this process can be formulated as follows.

(9)

ə → a [(C)C-

This schwa strengthening rule does not operate in all loanwords in which the schwa occupies the initial syllable. Consider the following items:

(10)

MA	AST	Gloss
ləmžəṛṛ	ləmžəṛṛ	‘drawer’
ləmelləm	ləmɛəllm	‘craftsman’
ləmžmər	ləmžəmmr	‘brazier’

The items above differ from those in (8) above in that the second syllable of the former does not contain a full vowel. This divergent behaviour can be explained by the syllable weight requirements in AST. The items which contain a full vowel in the second syllable tend to undergo schwa strengthening to make the initial syllable more prominent than the second. Thus, the main structural difference between the items in (8) and those in (10), and which motivates schwa strengthening in (8), is the presence of CV(C) as a second syllable in the items in (8) but not in (10). This creates a situation of syllable prominence which seems to be tolerated in *ləmžəɾɾ* but not in *ləbžar*. Thus, prominence adjustment triggers schwa strengthening in the first item, thus yielding *labžar*, but not in the second viz. **lamžəɾɾ*. We need thus to reformulate the schwa strengthening rule to accommodate this new provision as follows.

(11)

ə → a [(C)C- (C) CV

Again, the prosodic motivation of this alternation is enhanced by a mirror image process which reduces the vowel /a/ into schwa in Tashlhit items borrowed into MA such as *laštwan* > *šštwan* ‘esplanade’ or deletes the vowel altogether as in *tiwizi* > *ttwiza* ‘collective work’.

The same initial syllable is the target of the insertion of a full vowel viz. /a/, though its nucleus is already filled by a high vowel. Consider the following examples:

(12)

	MA	AST	Gloss
a.	ssiba	ssayba	‘anarchy’
	zzitun	zzaytun	‘olives’
	llimun	llaymun	‘oranges’
b.	ttuʃil	ttawʃil	‘receipt’
	luqat	lawqqat	‘appointed times’
	lyuməyya	lyawmiyya	‘calendar’

A situation of hiatus results from the insertion of /a/ before /i/ or /u/. i.e. *zzitun* > **zzaitun*, and *luqat* > **lauqat*. This is remedied by changing the vowel into a glide y or w, which represents a productive process in Tashlhit termed vowel glide alternation. A basically similar process takes place in the following set of MA loans.

(13)

MA	AST	Gloss
ttilifun	ttalifun	‘telephone’
bišklit	bašklit	‘bicycle’
fliyyu	flayyu	‘pepper mint’
ttisæ	ttasie	‘space’

In the MA forms above, the initial syllable is headed by an /i/ vowel. The same position is filled by the mid vowel /a/ in the AST forms. There are two possible ways to account for this alternation. The first one suggests that this involves a feature changing process, whereby [-consonantal, -round, + high] becomes [-consonantal, - high, - round]. This is supported by the assumption that the vowel /a/ is the least marked vowel in Tashlhit (cf. Bensoukas, 2002, 2003). The second analysis would account for this alternation by considering it as a case of vowel epenthesis which operates in the forms in (12) above. According to this analysis, the form *ttilifun* undergoes /a/ epenthesis and becomes **ttailifun*. The /i/ turns into its corresponding glide to avoid vowel hiatus, viz *ttaylifun*⁵. The glide then deletes to derive *ttalifun*. Although it is costly in terms of the number of the processes it involves, the second analysis proves to be more adequate in the sense that it adheres to a more general and unified account for the adjustments occurring in the initial syllable of certain loanwords which are motivated by syllable weight requirements.

Certain segments tend to geminate in certain syllable positions. In the set below, the onset of the second syllable is geminated.

(14)

MA	AST	Gloss
ṭṭæun	ṭṭæɛun	'pestilence'
ṭṭaqa	ṭṭaqqɑ	'(solar) energy'
baqi	baqqi	'still /any more'
lḥayat	lḥayyat	'life'

This alternation results in the creation of the coda of the initial syllable, and contributes, accordingly, to the increase of its weight content.

Another process which affects the initial syllable consists in the deletion of the schwa of the second syllable in the borrowed form. Consider the following instances:

(15)

MA	AST	Gloss
kam ə	lkamyu	'lorry'
yyu		
lmar ə	lmaryu	'wardrobe'
yyu		

⁵ This postulation goes along the general process of /a/ insertion occurring in many cases of MA loan nouns. To account for the alternations in (13 above) as a case of vowel change (i > a and u > a) would miss this generalization.

The deletion of schwa in (15) is followed by the simplification of the geminate⁶. This can be explained by the fact that schwa deletion has resulted in the degeneration of the second syllable. This in turn has led to the redistribution of segments over syllable nodes.

We can conclude that most alternations occurring in the subsets above affect mainly the initial syllable. The different adjustment processes, i.e. schwa strengthening, initial /a/ insertion, diphthongisation, gemination, or second syllable degeneration result in one way or another in the increase of the weight of the initial syllable. Thus, the input syllable structure of this category of loanwords is not maintained. Prosodic adjustment processes tend to degenerate or alter the internal structure of these syllables. This is motivated by the integration of these forms into the AST phonological and morphological systems. In the following section we will investigate whether the third category of MA loanwords undergoes similar alternations.

1.3. Fully Integrated Loans

The alternations undergone by this category of MA loans reveal three important facts: (i) they are very limited in number, (ii) the changes are unpredictable as there is no systematic relationship between the input and the adapted forms of loans, (iii) they affect not only the vocalic component, as it is the case in the two previous categories, but also the consonantal constituency. In addition to segment insertion and deletion, these loanwords also undergo changes at the level of the feature content of consonants.

Some of the alternations affecting this category of loanwords concern the feature content of stem consonants, while others result from affixation morphology. Input morphemes are substituted by those of the borrowing language. Their occurrence and output structures are accordingly predictable. Consider the following illustration:

(16)

MA	AST	Gloss
masʒid	timzgid	'mosque'
ʃʃawm	uʒum	'fasting'
ʃʃala	taʒallit	'prayer'
xadiʒa	xliʒʒa	'Khadija'

The form *timzgid* has undergone the prefixation of the feminine prefix [ti]. This prefix is attached to the AST feminine nouns which do not have masculine counterparts such as *tirmt* 'meal', *tisnt* 'salt', *tiddi* 'height'. The remaining stem segments are [ti-]mzgid. The comparison of this word with its input form *masʒid* reveals that it has gone through the following process of adjustment.

⁶ There are exceptions to this process in which the geminate is maintained, viz. *ʒʒuṭyya* 'flea' and *lfuqyya* 'a kind of dress'

(17)

Input	/masʒid/
Feminine prefix	ti-masʒid
a deletion	ti-msʒid
ʒ > g	ti-msgid
voicing	ti-mzgid
output	timzgid

This derivation reveals some important facts, namely that: (i) this category of loanwords undergoes many adjustment processes, unlike semi-integrated loans, (ii) the changes occurring in the features of the segments /s/ and /ʒ/, which become [z] and [g] respectively, are unmotivated on the basis of their existence or absence in the AST input segmental inventory⁷. A possible explanation to this phenomenon would be to stipulate that, ʒ > g alternation is driven by identity avoidance, i.e. OCP effects, of two sibilants co-existing in the same root and specified differently for voice and anteriority.

The other forms undergo basically similar adjustment processes. The AST feminine morpheme inflection operates in the forms *ti-γri* and *ta-zalli-t*. On the other hand, the MA feminine morpheme deletes in the input forms *qraya* and *ʃʃala*. Consonant adjustment takes place in the forms *qraya* > *tiγri* in which /q/ spirantises to become /γ/. Similarly, the /s/ in *ʃʃala* is voiced in *tazallit*.

Many other repairs involving insertion or deletion of consonantal material in the borrowed items are difficult to predict. The difficulty is amplified when the segments involved are part of the word root, and these are generally preserved in the process of loanword integration. Consider the following instances:

(18)

MA	AST	Gloss
fəɫfla	ififl	‘pepper’
k ^w əḥba	takuḥḥut	‘coughing’
ʒaɾ	adʒaɾ	‘neighbour’
dənʒal	biṭəlʒan	‘aubergine’

The item *fəɫfla* is subject to two types of changes. The first one affects segments which have a morphological status, namely the deletion of the MA definite article [l-] and the feminine suffix [-a]. The state marker insertion in *adʒaɾ*, and the Amazigh feminine affix in *ta-kuḥḥu-t* are also instances of morphological adjustment. This stage of adaptation is predictable, given that the morphological material of the source language is, generally, not maintained by borrowings. When extracting morphological units, we would be left with these roots which represent

⁷ /s/ and /ʒ/ are part of the phonemic inventory of AST (cf. Marouane, 2005).

the input to the AST adapted forms: *lfəʎfl*, *žar*, *dnžal*, and *kəħb*⁸. Even these roots undergo insertion and deletion alternations and acquire the following structure:

(19)

MA	AST
lflfl	fifl
žar	džar
dnžal	biṭlžan
kħb	kuħħu

The form *flfl* undergoes insertion of the vowel /i/ and deletion of the radical consonant /l/. similarly, the /ž/ of *žar* is affricated and becomes dž⁹. The gap between the MA form *dnžal* and the AST adapted version *biṭlžan* is wide and consists of a difference of two stem segments, i.e. *bi* present in the output form and absent in the input item. There is no way to explain the presence of these segments in the output except by postulating that the AST form originates rather from the Classical Arabic form *badinžan*, in which the initial sequence [ba] surfaces¹⁰. The derivation of the *biṭlžan* from *badinžan* can be outlined as follows:

(20)

Input form	badinžan
/a/ deletion	bدينžan
/i/	bidنžan
redistribution	
/d/ devoicing	bitنžan
n~l alternation	biṭلžan
output form	biṭلžan

We have seen that this category of loanwords undergoes many adjustment processes so much so that it is difficult to establish a systematic relation between input and output forms for certain cases. The opacity characterizing this category of loan items can be attributed to the period of history in which borrowing took place. That is, the older a loanword is, the more opaque its structure is expected to be, when compared with the input form. In the following section, we will attempt to provide a principled account for these alternations on the basis of the TCRS.

⁸ The schwa vowels are not included in these stem forms, given that these vocoids are phonetic in nature and do not occur in input lexical forms.

⁹ The occurrence of affrication is very limited, given that AST, and Tashelhiyt in general, does undergo such a process.

¹⁰ This enhances the fact that the form *biṭlžan* is borrowed earlier in history, a fact which in turn suggests that the opacity of the alternations undergone by this category of loans can be attributed to the fact that they are old borrowings.

2. The Constraints and Repair Strategies Account (TCRS)

TCRS consists of a set of universal principles which provide an adequate explanation for the process of loanwords integration within the phonological system of a borrowing language and accounts for any potential adjustments that any loan item might undergo to repair any constraint violation. The TCRS is argued to provide an adequate explanatory device for loanword adaptation. The theory consists mainly of the Preservation Principle, the Threshold Principle, the Minimality Principle and the Prosodic Hierarchy. Some components of the TCRS are presented herein. We start with the Preservation Principle which accounts for the tendency of loanwords to preserve their segmental structure.

(21) Preservation Principle (Paradis, 1996: 3)

Segmental information is maximally preserved, within the limits of the Threshold Principle.

This principle limits structure maintenance to the segmental structure and does not include syllable and metrical constituency. The Threshold Principle fixes the limits at which segmental structure is preserved and allows for its deletion when its maintenance is too costly. The level at which repair mechanisms apply is determined by the Minimality Principle below:

(22) Minimality Principle (Paradis, 1996 : 4)

Repairs :

- a. apply at the lowest phonological level to which the violated constraint refers, and
- b. involve as few strategies (steps) as possible.

The TCRS assume a phonological hierarchy which ranges from terminal features to metrical units.

(23) Phonological Level Hierarchy (PLH) (Paradis, 1996: 4)

Metrical level > syllabic level > skeletal level > root node > non-terminal feature > terminal feature.

The principles of the TCRS scan the loanword's phonological structure both horizontally (segmental level) and vertically (prosodic level). The non-alterability of the first category of loanwords is accounted for within this framework by virtue of the Preservation Principle which expresses a universal tendency for loanwords to preserve their input segmental structure under borrowing. This maintenance principle can be violated only in case preservation is too costly, that is when it violates a fundamental constraint of the borrowing language.

We will argue that MA loanwords undergo certain alternations aiming at readjusting their prosodic structure so as to conform to the AST prosodic structure. These alternations are implemented by processes which insert a segment or alter their nature. The alternation undergone by MA loanwords can, to a great extent, be predicted and accounted for by the TCRS, in the sense that these changes consist mainly of insertion, or feature changing processes. Deletion alternations are,

however, very limited and mostly morphologically motivated. Given the fact that the deletion of root segments is not a natural process in loanword adaptation, and cannot, therefore, be accounted for within the framework of the TCRS, we will not extend our analysis to the category of loanwords which exhibits such alternations, i.e. the fully integrated loans.

2.1. Non-alterability as a Case of Structure Preservation

The first category of loans does not undergo any alternation and this is predicted by the TCRS through a general cross-linguistic assumption that loanwords tend to preserve their segmental and prosodic structures under borrowing. Practically, this entails that these MA loanwords do not violate any important constraint of AST.

Indeed, the main explanation that can be provided in this respect is related to two main characteristics of this category of loanwords. First, the vocalic segments in these items consist only of full vowels, and this avoids all the alternations affecting schwa vowels, given that the occurrence of schwa behaves differently in MA and AST. Second, all the forms contain straightforward syllabifiable segmental sequences, consisting mainly of (C)CVC(C) structure predicted by the syllabification mechanisms of both MA and AST varieties.

We would then conclude that this category of loans does not pose any problem within the TCRS framework, in the sense that it represents the most predictable form of loanwords within this theory.

2.2. Initial Syllable Alternations

We have seen that the second category of loanwords undergoes alternations affecting mainly their vocalic component. They consist mainly of processes inserting a vowel, strengthening schwa into a full vowel, or geminating the coda of the initial syllable, or deleting the Amazigh feminine marker. These changes respect the Preservation Principle in that they maintain, except for morphological purposes, the input structure of the loanwords. The major generalisation formulated concerning the motivation of these alternations consists in the need to generate a prominent initial syllable. That is all the vowel epenthesis and vowel strengthening alternations result in a prosodic structure in which the initial syllable is the most prominent according to AST stress criteria. As a matter of fact, all the processes undergone by the data in (13, 14, and 15) affect in one way or another the weight component (i.e. moraic content) of the leftmost syllable to make it more prominent than the other syllables in the word.

Similarly, the alternations affecting the items in (5) result in the creation of a new syllable and thus in the shift of syllable prominence in most cases to the initial syllable, in terms of the AST stress system. Thus, the forms *bəq.qal*, *fəɾ.ɾan*, and γ^w *rraf*, become *abq.qal*, *afr.ɾan* and *a* γ^w *rraf*. While the MA input forms are supposed to receive final stress *bəq.qa'l*, *fəɾ.ɾa'n*, and γ^w *ərra'f*, the AST stress system predicts that syllable prominence would shift to the created initial syllable viz. *a'bq.qal*, *a'fr.ɾan* and *a* γ^w *rraf*, given its weight content (cf. Marouane, 1997, 2005). The same behavior is attested in the forms like *ku.za.ni* and *sla.wi* in which

stress shifts from the penultimate syllable as predicted in MA to the initial syllable in the adjusted forms *a'.ku.za.ni* and *a's.la.wi* in AST.

Therefore, the main constraint which these loanwords observe is structure preservation which prohibits segment deletion. Prosodic adjustment is effected through vowel insertion and schwa strengthening.

Except for morphologically motivated processes, segmental deletion does not occur in the first two categories of loanwords. Adjustment takes the form of epenthesis and segmental feature change rather than deletion. We will formulate constraints within the TCRS to account for these tendencies.

(24) Segment Deletion Prohibition

Each segment in the input must have a corresponding output (except for morpheme segments)¹¹.

Most cases of prosodic ill-formedness in the second category of loanwords are resolved by vowel epenthesis and schwa strengthening. This is captured in the principle below.

(25) Vowel Epenthesis

Affix the vowel [a] word initially to nominal forms not beginning with the definite article /l/.

Generally, the prefixation of the state marker [a-] affects a wide set of AST nouns¹², and not just occupation nouns, as is illustrated below:

	MA	AST	Gloss
(26) a.	ʔbib	aɖbib	'physician'
	gəzzar	agzzar	'butcher'
	nəžžar	anžžar	'carpenter'
b.	fərɖi	afrɖi	'rifle'
	kuɾa	akur	'ball'

We would, therefore, restrict the operation of the rule of the state marker prefixation to the occupation noun, which can be formulated as follows:

(27) Initial [a-] prefixation

Affix the vowel [a-] word-initially in a nominal loanword not beginning with a definite article.

The other type of alternation which involves the strengthening of the schwa vowel of the initial syllable is accounted for by the following principle:

¹¹ Morpheme segments represent an exception to this constraint.

¹² The state marker prefix [a-] represents an important component of the morphological identity of singular nouns in Amazigh in general.

(28) Strengthening of Schwa Vowel

The schwa occurring in the initial syllable is interpreted as a full vowel when followed by a full vowel syllable.

We also consider the set of loanwords in which the vowel /a/ is inserted before a high vowel /i/ or /u/, thus yielding the diphthongs [ay] and [aw], respectively.

(29)

MA	AST	Gloss
ttisir	ttaysir	‘good luck’
zzitun	zzaytun	‘olives’
luqat	lawqqat	‘appointed times’
ludu	lawḍin	‘ablutions’

The insertion of the diphthongs [ay] and [aw] can be explained by making reference to the process which affixes the vowel /a/ word initially. To motivate the insertion of the full vowel /a/ in the position in which a high vowel is already present in the input form, we will argue that the latter vowel is realized as an archisegment [I,U], and not specified for the feature [consonantal]. This analysis of the archisegments finds further support in the alternation which occurs in MA loanwords in which the high vowel /i/ in the input forms is replaced by an [a] in AST forms.

(30)

MA	AST	Gloss
ttilifun	ttalifun	‘telephone’
bišklit	baškliṭ	‘bicycle’
fliyyu	flayyu	‘pepper mint’
ttisæ	ttasiε	‘wideness’

In these forms, too, the high vowel enters AST as an archisegment, i.e. *tllifun*, *bIšklit*. They then undergo the process of /a/ insertion resulting in **ttaylifun*, **bayšklit*, **flayyyu*, and **ttaysiε*. Afterwards the glide deletes. This can be motivated by the weight pattern of the words in the sense that the initial syllable is already prominent and does not need more weight.

(31)

tta.li.fun	‘telephone’
((σ _s σ _w) σ _s)	
baš.kliṭ	‘bicycle’
(σ _s σ _w)	
flay.yu	‘pepper mint’
(σ _s σ _w)	

We can conclude that all these three repairs are instances of one process which inserts a vowel /a/ in the initial syllable which is motivated by the need to generate a well-formed AST weight pattern. We can thus formulate a unified vowel insertion rule as follows:

(32) /a/ Insertion Rule

Insert an /a/ vowel in the initial syllable in the position of a schwa or before an archsegment.

We will see that the mechanism in (32) is motivated by a more general tendency of AST prosodic structure. Consider the items in which the initial syllable is geminated. The items *baqi* ‘still/not yet’, *ṭṭaεun* ‘plague/pest’ and *Ḥhayat* ‘life’ surface in AST as *baqqi*, *ṭṭaεεun*, and *Ḥhayyat*, respectively. Again gemination of the coda of the initial syllable results in the strengthening of the weight of the initial syllable.

There is another type of alternation in which the second syllable degenerates in the output form, thus enhancing the weight content of the initial syllable. The items *žžutəyya* ‘flea’, and *kaməyyu* ‘lorry’ surface as *žžutyya* and *lkamyu*.

We would thus formulate a unified rule to account for all these processes which increase the weight of the initial syllable of certain loanwords as follows:

(33) Initial Syllable Prominence Constraint

The initial syllable is prominent (stressed) when it does not co-occur with a superheavy syllable.

$$\sigma_w \longrightarrow \sigma_s \text{ [-- } \sigma_w$$

We can then conclude that all these adjustment alternations are prosodically motivated. Thus, there is a need for working out a more general prosodic principle which accounts for these alternations.

The same principle governs the alternations in which schwa is strengthened into a full vowel, as is illustrated below:

(34)

MA	AST
lməq.la	lmaq.la
ləx ^w .bar	lax ^w .bar
ləb.zar	lab.zar

Therefore, we need to investigate a prosodic structure that is higher than the syllable, namely the foot structure. Indeed, it is the organisation of syllables into feet which motivates the prosodic alternations occurring in the second category of loanwords such as schwa strengthening, vowel insertion and gemination, given that all these processes target mostly the initial syllable and result in increasing its weight.

Conclusion

This paper has introduced MA loanwords used in AST as forming a non-homogenous lexical class. They are grouped into three categories according to their degree of integration into the AST phonological structure, viz. non-integrated, semi-integrated, and fully-integrated loans. We have addressed how the segmental and syllabic structures of each of these loan categories react when they are integrated into AST. We have found out that at the level of segmental structure, MA loanwords undergo epenthesis and feature changing processes, but rarely phonologically motivated deletion. At the level of syllable structure, most alternations tend to affect the initial syllable by increasing its weight, either by schwa strengthening, vowel epenthesis, or gemination.

We have also attempted to provide a principled account for these alternations by adopting the main principles of the TCRS. We have discovered that Repair Strategies in this theory predict most phonological changes occurring in MA loanwords, namely that they are structure preserving. This means that ill-formedness in the input forms is resolved mainly by epenthesis and feature changing processes rather than by segmental deletion.

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