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Reflexes of Old Arabic */ǧ/ in the Maghrebi Dialects

Jairo Guerrero Parrado

Abstract: The present paper discusses from a diachronic standpoint the realizations of *ǧīm* in the various Maghrebi dialects. It covers the following issues: reflexes of Old Arabic */ǧ/, phonetically conditioned shifts involving /ǧ/ and /ž/, discussion and conclusions. The remaining part of the study is devoted to a presentation and discussion of evidences suggesting that affricate /ǧ/ was formerly more widespread among first-layer dialects.

Résumé: Le présent article a pour bout d'élucider d'un point de vue diachronique les réalisations du *ǧīm* dans les différents parlers maghrébins. Il traite les aspects suivants: reflets du */ǧ/ de l'arabe ancien, altérations conditionnées du /ǧ/ et du /ž/, discussion et conclusions. Dans le reste de l'étude nous présentons et discutons les preuves indiquant que l'affriqué /ǧ/ était autrefois plus répandu parmi les parlers pré-hilaliens.

Keywords: *ǧīm* (ج), co-occurrence restriction, Maghrebi Arabic, Arabic dialectology, Arabic phonetics, Arabic linguistics.

Mots-clés: *ǧīm* (ج), restrictions de cooccurrence, arabe maghrébin, dialectologie arabe, phonétique arabe, linguistique arabe.

1. Introduction

Arabic stands out as the only Semitic language which has not preserved the voiced velar stop */g/ of Proto-Semitic. Instead, Old Arabic is believed to have had an affricate reflex /ǧ/ which would correspond to the /g/ of other Semitic languages. For instance, Syriac *gušmā* and Jibbali *gəsm* are reflected by Arabic *ǧism* 'body'. Nevertheless, this statement is not completely true since the medieval grammarians report in their philological treatises different realizations regarding the pronunciation of the OA *ǧīm* and none of them seem to be related to that of /ǧ/, i.e. a voiced palato-alveolar affricate. Despite not being as accurate as desired, the phonetic descriptions provided by Sībawayhi and al-Zamaxšarī suggest that the *ǧīm* was pronounced as /g/ and /ž/ or as a strongly palatalized /g^y/. Therefore, affricate /ǧ/ must be simply regarded as the normative pronunciation of *ǧīm* in literary Arabic and not necessarily as the earliest stage of this phoneme in OA.

The present author concurs with the theory put forward by Cantineau (1960) regarding the phonetic evolution of Proto-Semitic /g/ within the Arabic vernaculars. We may summarize this theory as follows: First /g/ → /g^y/ through palatalization, then /g^y/ → /d^y/ through apicalization. Later on /d^y/ developed to /d/ in some dialects as the result of the loss of its palatal element. Likwise, /d^y/ shifted to /y/ in a second group after losing its dental release. Similarly, in a third group /d^y/ developed to /ǧ/ which in turn became /ž/. Finally, this latter sound gave rise to /z/ in a few dialects.

This article aims at analyzing the historical development of the Arabic */ǧ/ ج within the dialects of the Greater Maghreb area. It attempts to prove that this phoneme already displayed different

reflexes in the dialects brought into North Africa by Muslim soldiers during the first wave of arabicization. The paper is organized as follows. Section 2 is a report on the current dialectal variants of */ǧ/ in Libya, Tunisia, Malta, Algeria, Morocco and Mauritania. In section 3, we examine the phonetically conditioned shifts undergone by */ǧ/ and /ž/ in the Maghrebi dialects and attempt to explain those changes from a diachronic perspective. Section 4 deals with some examples where non etymological /ǧ/ and /ž/ arise as the result of other phonological changes. Section 5 discusses the data and revisits some of the theories claiming that */ǧ/ was inherited as /g/ in Moroccan Arabic. Lastly, in section 6 we offer our conclusions.

In order to study the *ǧīm* and compare its different Maghrebi realizations, a vast amount of data was gathered. The major sources include: subject-related literature as well as dialectological questionnaires and observations carried out during the author's fieldwork (these latter two only for northern Morocco and western Algeria).

2. Reflexes of OA */ǧ/ in the Maghreb dialects

It can be said that the realization of */ǧ/ in modern Maghrebi dialects is relatively quite uniform, with two major palato-alveolar reflexes, /ž/ and /ǧ/, and one marginal sibilant reflex /z/. This is particularly true when comparing it with the situation in Eastern dialects, where this sound exhibits a good deal of variation: /g/ in Cairene Arabic, parts of Egypt, Saudi Arabia, Yemen and Oman; /g^y/ or /d^y/ in Upper Egypt, Sudan and some Bedouin dialects of Arabia; /y/ in Gulf Arabic and North Arabia; /d/ in Upper Egypt; /ž/ in urban dialects of Palestine, Syria and in most but not all dialects of Lebanon; /ǧ/ in Iraq, partially in Yemen and in rural dialects of Palestine, Jordan and Syria; /ts/ in several regions of Syria, /č/ in Palmyra.

2.1. The reflex /ǧ/ of */ǧ/

The old *ǧīm* is generally realized as the voiced palatoalveolar affricate /ǧ/ in Maltese (Puech 2014: 74), Siculo-Arabic (Lentin 2006-2007: 76) and in most pre-Hilali sedentary dialects of northern Algeria: Tlemcen (W. Marçais 1902: 15), Algiers, Cherchell (Grand'Henry 1972: 8), Ténès, Blida, Médéa (Ph. Marçais 1991: 376), Constantine, Sétif, Borj Bou Arréridj and Msila. It is also realized this way in some Bedouin dialects spoken across an area that stretches from the Mitidja valley to Mostaganem and Mascara (Ph. Marçais 1991: 378). This pronunciation was also predominant among the mainstream dialects of Andalusi Arabic (Corriente et al. 2015: 54).

In most rural dialects of Morocco and some of Algeria, */ǧ/ is partially preserved in certain environments. Thus, /ǧ/ occurs as an allophone of /ž/ when geminate in Tangiers (*žbəl* 'mountain' → *d-ǧbəl* 'the mountain', cf. W. Marçais 1911: xiii; Iraqui-Sinaceur 1998: 134), Anjra (*ḥāžža* → *ḥādǧa* 'old woman', cf. Vicente 2000: 45), Tetouan (Singer 1958: 110), and Chefchaouen (Natividad 1998: 111). For the dialect of Anjra (Vicente 2000: 45), the */ǧ/ has also occasionally been maintained in the vicinity of /n/ or /r/. In Jijel, /ǧ/ only obtains when geminate or before /n/ (Ph. Marçais 1952: 11-12). Furthermore, the affricate reflex prevails in the dialects of northern Taza and Chefchaouen even when being in word-initial or word-internal position: *ǧʁu* 'dog', *ʁǧl* 'foot, leg' (Natividad 1998: 111); *ǧīr* 'lime', *naʕǧa* 'sheep' (Behnstedt & Benabbou 2002: 56-57).

2.2. The reflex /ž/ of */ǧ/

The voiced alveo-palatal fricative /ž/ is by far the most common reflex of */ǧ/ among the Maghrebi dialects. Except for Maltese and Andalusi Arabic, where /ž/ seems to be a marginal allophone of

/ǧ/, fricative /ž/ for OA /ǧ/ spreads almost everywhere throughout Libya, Tunisia, Mauritania and Morocco. For Algeria, affricate /ǧ/ obtains in distinct places throughout the northern strip, while /ž/ prevails in the rest of the country. As far as I know, all Bedouin dialects in the Maghreb display /ž/ for */ǧ/ (only Cantineau's B and C groups being excepted).
Different sociolinguistic processes seem to have triggered the replacement of /ǧ/ by /ž/ in some urban dialects. In Oran for example, /ǧ/ was quite common by 1903 while the present-day dialect only exhibits /ž/ (Guerrero 2016: 276).

2.3. The reflex /z/ of */ǧ/

The realization of */ǧ/ as the sibilant /z/ (along with the shift of /š/ to /s/) is one of the most salient features of the Moroccan Jewish dialects. This sound change is also a conspicuous feature of the speech of Jews in Algiers. In spite of the fact that this pronunciation cannot be regarded as a lisp but rather as an articulation difference, it likely originated from a difficulty in pronouncing a foreign phoneme such as /ž/. This assumption is supported by the fact that */ǧ/ > /ž/ > /z/ is also attested in old urban dialects such as those of Tetouan, Rabat, Meknes, Fez or Tadla. Thus, this "mispronunciation" would have been related to the learning of the language from a non-native speaker.
Sibilant merger, together with the realization of */q/ as a glottal stop /ʔ/, can be regarded as an archaic feature of the medina speech (Heath 2002: 133; Aguadé 2003: 87), and hence a late pre-Hilali trait (Lévy 1998: 19 note 30).

Fez: *ḥāžža~ḥāzza* 'pilgrim', *ržāl~rzāl* 'men', *Ṭānža~Ṭānza* 'Tangiers'.

Fez Jewish : *fžəl* > *bzəl* 'radish', cf. Lévy 2009: 179.

Meknès: *žāt* > *zāt* 'she came', *žənnĭyya* > *zənnĭyya* 'jinnee-woman', cf. Stroomer 2004: 292.
Rabat: *žāt* > *zāt* 'she came', cf. Messaoudi 1998: 159.

3. Phonetically conditioned shifts undergone by */ǧ/ and its reflex /ž/

As well as other Semitic languages, Arabic also restricts the occurrence of certain combinations of consonants within the same root. Among other scholars, this matter has been investigated by Greenberg (1950), McCarthy (1994) and Frisch, Michael & Pierrehumbert (1997). An analysis of the previous works tells us that Classical Arabic roots show "a systematic avoidance, though not an absolute avoidance, of adjacent homorganic consonants". Moreover, it appears that roots combining coronal stops fricatives are particularly subject to co-occurrence constraints, cf. Alderete & Frisch 2007: 381.
Returning to the object of our study, it is well known that affricate /ǧ/ and fricative /ž/ are subject to specific co-occurrence restrictions in Maghrebi Arabic. Thus, most dialects tend to avoid somehow the co-occurrence of /ǧ/ or /ž/ with sibilants and, to a lesser extent, dentals. In order to do so, each dialect makes use of some of the following phonological processes: assimilation, dissimilation, metathesis and devoicing.

3.1. Assimilation

3.1.1. Sibilant harmony (ž...s, z, š > z...s, z, š)

Assimilation is a process by which two nearby sounds become more alike. The main kind of assimilation involving OA *ǧīm* within the Maghreb area is the one we encounter in words such as Tunisian *zūz* (**zawǧ*) or Libyan *nzāṣ* 'pears' (**ʔiǧāṣṣ*). In these examples, the fricative reflex of OA */ǧ/ assimilates to a previous or subsequent sibilant. This phenomenon is accounted for by a long-distance-sibilant-harmony process and it is considered to be a distinguishing feature of most Tunisian and Libyan dialects. Moreover, it is attested in Eastern Algerian dialects and, to a lesser extent, in Ḥassāniyya Arabic as well as in some Saharan-type dialects:

Tripoli (Pereira 2010: 66-67): *zōz* 'two' (**zawǧ*), *sfənz* 'doughnut' (**safanǧ*), *sərz* 'saddle' (**sarǧ*), *zŭzzāṛ* 'butcher' (**ǧazzār*), *ʕzūz* 'old woman' (**ʕaǧūz*).
Tunis (Singer 1984: 9; 123): *zōz* 'two' (**zawǧ*), *zāz* 'to pass' (**ǧāza*), *zəns* 'type' (**ǧins*), *zūz* 'walnuts' (**ǧawz*), *zəbs* 'plaster' (**ǧibs*), *zāz* 'to go in, to come in' (**ǧāza*), *zhēz* 'trousseau, window frame' (**ǧihāz*), *zlīz* 'glazed tiles' (**zulayǧ*), *zāz* 'vitriol' (**zāǧ*).
Eastern Algeria (Cantineau 1938: 11): *ʕŏzūz* 'old woman' (**ʕaǧūz*), *zăzzār* 'butcher' (**ǧazzār*).
The Gəbla, Mauritania (D. Cohen 1963: 21): **nsəž* > *nzəž* > *nzz* 'he wove' (**nasaǧa*), *zōʷz* 'walnut tree' (**ǧawz*), *zāyəz* 'exceeding' (**ǧāʔiz*), *əzza* 'he did a favour' (**ǧazā*).
Tata, Morocco (Heath 2002: 133): *zūz* 'pass!' (**ǧuz*).

Besides this, sporadic cases of sibilant assimilation are to be found in a few items of Algerian and Moroccan dialects: *yəzzi* 'enough' (**yaǧzī*), *bəzzāf* 'a lot, very, many' (**bi-l-ǧuzāf*), cf. Ph. Marçais 1952: 112. In Fez and Marrakesh *žāza* 'he repaid (someone)' (**ǧāzā*) is used alongside *zāza*. The same is true for *yĭzzāk mən* 'enough!' cf. De Prémare 1993(2):186-187. One could add to this list the Turkish loanword *cezve* [d͡ʒeːzvə] > *zīzwa* 'sort of coffee pot' (De Prémare 1995(1): 441) and, if the etymology is correct, **ǧillawz* > *zəlz* (*l-lūz*) 'hazelnut' (De Prémare 1995(1): 361). Particularly interesting are the instances recorded in the region of Ghomara by Amina Naciri: *ka-yzŭwwzu* 'they get married' (**tazawwaǧa*), *zūz* 'two' (**zawǧ*). In Larache, I came across an informant who surprisingly pronounced *ʕzūza* 'mother-in-law' and *zˀzīra* 'island' for **ʕaǧūza* and **ǧazīra*. We encounter further isolated cases in Maltese and in Andalusi Arabic: *għeżż* 'to be lazy', *għażż* [ɐːzs] 'laziness' (**ʕaǧiza*); *ḥuzza* 'pleat' (**ḥuǧza*), cf. Corriente 2013: 41.

It is worth highlighting that, as can be seen above, sibilant harmony only obtains as a systematic process in dialects where the old */ǧ/ is generally reflected by the fricative /ž/.

3.1.2. Sibilant harmony (z...š, ž > ž...š, ž)
As in the previous case, this kind of consonant harmony also occurs between coronal sibilants of a stem. The difference here is that in this case, alveolar fricatives (/s/, /z/) become post-alveolar (/š/, /ž/). This process is characteristic of Bedouin-type dialects spoken in a geographical area that stretches across the Algero-Moroccan border:

Northeastern Morocco: **žhāz* > *žhāž* 'trousseau' (**ǧihāz*), **ʕžūza* > *ʕžūža* 'old woman' (**ʕaǧūz*), cf. Behnstedt & Benabbou 2005: 24-25.
La Saoura (Southwestern Algeria): *žūz* > *žūž* 'two' (**zawǧ*), *žhāz* > *žhāž* 'trousseau, equipment' (**ǧihāz*), cf. Grand'Henry 1979: 216.

Likewise, most Moroccan dialects show a regressive assimilation by which /s/ and /z/ transform into /š/ and /ž/ when followed by a post-alveolar, e.g.: *zūž* > *žūž* 'two' (**zawǧ*), *zwāž* > *žwāž* 'marriage' (**zawāǧ*), *zžāž* > *žžāž* > *žāž* 'glass' (**zuǧāǧ*), *sžən* > *ššən* 'prison' (**siǧn*), *zəbži* > *žəbži* 'jet black', *zəbbūž* > *žəbbūž* 'wild olive tree'.

3.1.3. Lenition */ǧ/ > /y/

As far as I know, the general lenition of */ǧ/ to the glide /y/ is geographically confined to the Persian Gulf region and parts of Yemen. As regards to Maghrebi Arabic, the only well-attested word where /y/ stands for */ǧ/ is *msīd* 'mosque; koranic school' (**masǧid*), cf. De Prémare 1995(2):38; 1999(1):195. This isolated example which is reported for most Maghrebi dialects may be traced back to an early Yemeni influence. Another clue about the origin of *msīd* could be found in the form this early Islamic term presents in Berber. Most of its dialects display forms where */ǧ/ is reflected as /g/ or /y/, which might suggest that Arabic *msīd* evolved from an earlier hypothetical *məsgʸĭd*, e.g.: Tashelhyit *timzgida*, Riffian *ṯamziyḏa*, Nefousa *tməzgidá* 'mosque', cf. Kossmann 2013: 84. Then, it is likely that a semantic differentiation was operated in some dialects of Maghrebi Arabic and *msīd* 'koranic school' became opposed to *məsǧĭd~məsžĭd* 'mosque'.

A further example of */ǧ/ > /y/ might well be Maltese *ejja* 'come!' (pl. *ejjew*) and Dellys (Algeria) *ayyā* 'come!' (fem. *ayyāy*, pl. *ayyāw*). Even if these items may show a lexical interference with *hayyā*/*ḥayyā* 'come on!', as suggested in Behnstedt & Woidich 2014: 94, we should not rule out a lenition from *īža*/*ayža*, forms attested in Tunisian Arabic and related to Constantine Jewish/Muslim *ayǧi*/*īǧi* and Jijel *īži*/*ži*, cf. Behnstedt 2014: 92.

3.1.4. Non-conditioned assimilations

There are further instances of assimilation involving */ǧ/ which seem not to be conditioned by the phonetic environment in which they occur.

Andalusi Arabic. /ǧ/ > /l/: *nallas* along with *naǧlas* 'I sit down' (* *ǧalasa*), cf. Corriente 2013: 41.

Ceuta Arabic. /ǧ/ > /b/: *bbăṛna* along with *ǧbăṛna* 'we found', *yəbbṛu* along with *yəǧbṛu* 'they find' (**ǧbr*), cf. Vicente 2016.

3.2. Dissimilation

Unlike assimilation, dissimilation is the phenomenon by which similar sounds become less alike. In a dissimilatory process, differentiation between two segments (the trigger and the target) occurs depending on their degree of similarity, their proximity and their occurrence order:

- Similarity: dissimilation may happen between identical or homorganic segments.
- Proximity: dissimilation is contiguous when the trigger is adjacent to the target, or non-contiguous if there are intervening segments between the dissimilee and the dissimilator.
- Directionality: depending on the direction in which dissimilation takes place, this can be progressive or regressive.

3.2.1. Regressive dissimilation of chuintants

This type of dissimilation is a widespread feature among those Algerian dialects exhibiting metathesis in lexical items with the sequence /ž/ + sibilant (/s/, /ṣ/, /z/). In the following examples from the dialect of Saïda, the dissimilating consonant is /š/ preceded by /ž/ that loses its chuintant element and becomes /z/: *žəyš* > *zəyš* 'armed gang', *žŏḥša* > *zŏḥša* 'she-ass', cf. W. Marçais 1908: 18.
Similar isolated instances have also been reported for nearby Ghazaouet and northern Taza, dialects in which the above-mentioned type of metathesis is uncommon, e.g.: *zīš* 'army', *zəḥš* 'she-ass', cf. Hocini 2011: 97; Colin 1921: 46. From my point of view, such sporadic occurrences should be regarded as lexical borrowings from neighbouring dialects.
Moreover, Moroccan Arabic displays a few instances where /ž/ shifts to /z/ in stems containing another /ž/, e.g.: *žənžlān* > *zənǧlān* 'sesame' (**ǧulǧulān*), *žərnīž* > *žərnīz* 'name of the *scolymus hispanicus*', *žəmrāž* > *zəmrāž* 'ablaze', cf. De Prémare 1993:175, 224.

3.2.2. Deaffrication
In dialects exhibiting an affricate reflex of */ǧ/, there is a tendency to deaffricate /ǧ/ to /ž/ when followed by an adjacent /d/, e.g.: *ǧdīd* > *ždīd* 'new', *drəǧ dārna* > *drəž dārna* 'the stairs of our house', *ǧdād* > *ždād* 'chickens', *ǧdām* > *ždām* 'elephantiasis' (Tlemcen, W. Marçais 1902: 25, 34; Algiers Jewish, M. Cohen 1912: 79).

3.2.3. */ǧ/ reflected as either /d/ or /g/
The Maghrebi /d/ and /g/ reflexes of OA */ǧ/ has traditionally been explained by scholars as a case of dissimilation triggered by the presence of other sibilants in the stem. To what extent this explanation is plausible will be discussed in section 5. We shall confine ourselves here to presenting data from different dialects in order to provide the reader with a picture of the geographical extension of the phonetic shift under study.

3.2.3.1. */ǧ/ reflected as /d/
Morocco: In most central and southern Moroccan dialects, */ǧ/ systematically shifts to /d/ in stems containing a following sibilant: *dāz* 'he passed' (**ǧāz*), *dzāya* 'reward' (**ǧzy*), *ʕdūza* 'old woman' (**ʕaǧūz*), *dəšra* 'village' (**ǧaššar* 'to leave'). Notice that the two consonants, */ǧ/ + (s, ṣ, z, or š) need not to be adjacent, there can be intervening consonants, e.g.: *dhāz* 'trousseau' (**ǧihāz*).

Algeria: Some Algerian dialects replace */ǧ/ with /d/ in a number of words. Thus, the capital Algiers is known in most Algerian dialects as *Dzāyər* (**ǧazāʔir*), while the country itself is referred to as *l-Žazāyər*. Moreover, in the dialect of the Jews of Algiers we find *tṣāṛa* 'insolence', *tsəd* 'body', *tsəm* 'body' (through devoicing from *dṣāṛa*, *dsəd* and *dsəm*, OA **ǧasāra*, **ǧasad* and **ǧism*), *təzma* 'boot' (through devoicing from *dəzma*, Turkish *çizme*), *ʕădzān* 'lazy' (**ʕǧz*), *dzīra* 'island' (**ǧazīra*), cf. M. Cohen 1912: 80. Another example is *dəšra* 'set of rural houses', cf. Ph. Marçais 1952: 120. Roughly speaking, the shift from */ǧ/ to /d/ in Algeria is infrequent and it only occurs in certain words.

Andalusi Arabic: *addaššā* 'he burped' (**taǧaššaʔa*), *dišār* 'smallholding', *dašīš* 'cracked wheat' (**ǧšr*), *daysūs* 'spy, robber' (**ǧāsūs*), cf. Corriente et al. 2015: 57.

Maltese: *dxix* [tʃɪʃ] 'the pieces of s.th. which has been pounded' (**ǧašīš*), *ddixxa* [ddɪʃʃɐ] 'to belch' (**taǧaššaʔa*), cf. Camilleri 2013.

Tunis: *dzīra* 'island' (**ǧazīra*), *daysūs* 'spy' (**ǧāsūs*), *dšīša* 'soup made of coarsely ground grains' (**ǧašīša*), *dašṛa* 'village' (**ǧšr*), *dăššāʃ* 'stingy' (**ǧašiʃa* 'to covet').

Similar examples have also been sporadically reported in other regions of the Arabic speaking world:
Ḥōrān, Syria: *dsūṛa* 'iron girders' (**ǧisr* 'bridge'), *daššar* 'to leave' (**ǧaššara*), cf. Cantineau 1946: 105.
Tchad: *diḥēš* 'donkey foal' (**ǧaḥš*), cf. Roth 1979: 95; *šədaʃa* 'courage' (**šaǧāʃa*), *šidērē* 'tree' (**šaǧara*), cf. Roth-Laly 1972: 245-6.
Daragözü, Turkey: *daḥš* 'donkey foal' (**ǧaḥš*), cf. Vocke & Waldner 1982.
Mḥallami, Turkey: *dašwe* 'belch' (**taǧaššaʔa*), cf. Vocke & Waldner 1982: 87.

Besides this, we shall point out a few instances where */ǧ/ shifts to /d/ when preceded by a sibilant:
Morocco: *zəddəž* along with *žəddəž* 'he glazed, enameled' (**zaǧǧaǧa*), cf. De Prémare 1995 (1): 289.
Oran: *zdāž* 'glass' along with *zāž* (**zuǧāǧ*), cf. Guerrero 2016: 277.
Mauritania: *sədṛaye* 'tree' (**šaǧara*), cf. Taine-Cheikh 1986: 417.

It is worth noting that, outside Morocco and certains parts of Algeria, instances of /d/ reflecting */ǧ/ occur chiefly in stems containing a following /š/.

3.2.3.2. */ǧ/ reflected as /g/
Morocco: In most northern Moroccan dialects, */ǧ/ arises as /g/ when followed by a subsequent sibilant (/s/, /ṣ/, /z/, /š/). Examples: *gāz* 'he passed' (**ǧāza*), *gəzz* 'he sheared' (**ǧazza*), *gzīra* 'island' (**ǧazīra*). Likewise, this feature is attested in most, but not all, Moroccan Jewish dialects, e.g.: *tgāwəz* 'small salads' (**ǧwz*), cf. Lévy 2009: 284.

Maltese: *gżira* [gzɪːra] 'island' (**ǧazīra*), *gireż* [gɪrəz] 'he moaned' (**ǧarasa*), *girex* [gɪrəʃ] 'he ground coarsely' (**ǧaraša*), aef*geżż* [geːzs] 'milk (goat, etc) by squirts', abc*geżża* [geːzzɐ] 'as much milk as is pressed out of the udder of the goat, cow etc'; *geżżej* [geːzzeːɪ] 'one who milks a goat, cow etc' (**ǧassa*), *gess* [geːss] 'to worm out information of s.o.' (**ǧassa*), *aefigaża* [gazɐ] 'to report on, to accuse, to grass on sb.' (**ǧzy*?).

Honaine (Western Algeria): *gəns* 'race' (**ǧins*), *gəzzāṛ* 'butcher' (**ǧazzār*), *ləngāṣ* 'pear' (**ʔiǧǧāṣ*), *gāšūš* 'piece of meat' (**ǧāšūš*), cf. Aïd 2015: 61.
Nedroma (Western Algeria): *naʃgəz* 'I feel lazy' (**ʃǧz*), *gəbs* 'plaster' (**ǧibs*), *gəzzār* 'butcher' (**ǧazzār*), cf. Ammour 2012: 80.
El-Milia (Eastern Algeria): *gəḥš* 'donkey foal' (**ǧaḥš*), cf. Ph. Marçais 1952: 120.
Tlemcen (Western Algeria): the sole instance attested is *gūsās* 'spy' (**ǧāsūs*), a probable borrowing from a Moroccan dialect according to W. Marçais.

Andalusi Arabic: several items in dialectal Spanish seem to show that a sporadic velar pronunciation of */ǧ/ existed in this extinct vernacular. Thus *maganto* and *manganzón* 'lazy person', as well as Portuguese *mengaz* might suggest an earlier form in Andalusi Arabic similar to Moroccan *məʕgāz* 'lazy' (**ʕǧz*).

In some dialects there seem to be cases where the shifts undergone by */ǧ/ entailed the formation of doublets with semantical differentiation. Such a contrast is shown by the following pairs: *žīš* 'army' ≠ *gīš* 'levy; gang of thieves' (**ǧayš*, De Prémare 1993(2): 288), *ghəz* 'it finished' ≠ *dhəz* 'he made preparations' (**ǧahaza*, De Prémare 1993(2): 254), *l-Žazāyər* 'Algeria' ≠ *Dzāyər* 'Algiers' (**al-ǧazāʔir*, Guerrero 2015b: 221), *sfənž* 'sponge' ≠ *sfənz* 'doughnut', (**safanǧ*, Pereira 2010: 66), *ghaġeż* 'to grow old' ≠ *gheżż* 'to be lazy' (**ʕaǧiza,* Maltese), *ʕgūza* 'old shrew' ≠ *ʕdūzti* 'my mother-in-law' (**ʕaǧūz*, Lévy 2009: 320), *yədzi* 'it suffices' ≠ *yəzzi*! 'enough is enough!' (**yaǧzī*, Marçais 1902: 29). Regarding the last doublet, I think that *yədzi* may be regarded as the original form in Tlemceni Arabic whereas *yəzzi* (<*yəžzi* by sibilant harmony) is probably a borrowing from another dialect.

Other dissimilations are sporadically attested, e.g.:
*/ǧ/ reflected as /g/ in stems containing no subsequent sibilants: Maltese *gedi* [geːdɪ] 'kid' (**ǧady*), Andalusi Arabic *mezgid* 'mosque' (**masǧid*). On the other hand, one may find a few items of unclear origin where /g/ occurs instead of an alleged /ž/~/ǧ/, e.g.: Moroccan *gŭrna* 'slaughterhouse', Honaine *gʷrən* 'make a hole'; (**ǧurn* 'basin, sink'?), Moroccan *gṛāna* 'frog' (mainly attested in northern varieties, elsewhere it surfaces as *žṛāna*). The same is true for the Spanish verb *zaragullir* 'to plant vine shoots' which may derive from Andalusi Arabic *zar*(*a*)*ǧūn* (**zaraǧān* 'vine shoot'), cf. Corriente 2005: 238 and 244. Besides these examples, Corriente et al. (2015) also cites Spanish *hámago* 'propolis' and *almogama* 'loof frame' as reflecting respectively **xamaǧ* 'rancidity' and Andalusi Arabic *al-maǧāmaʕ*

*/ǧ/ reflected as /k/: Andalusi Arabic *nineqquéç* 'I soot' (**naǧāsa*), Moroccan Arabic *kəsda* 'body' (**ǧasad*).

3.3. Metathesis

3.3.1. Metathesis triggered by the presence of sibilants within the stem

The dialects undergoing this type of metathesis can be split up in two groups: the first one encompasses those vernaculars in which metathesis obtains systematically in stems containing a historical /ǧ/ followed by a sibilant. As regards the second group, it includes every dialect where sibilant metathesis only occurs isolatedly. The first group is mainly represented by some Bedouin-type dialects spoken in western Algeria (Cantineau's group D) and the former Department of Constantine.

Constantine and the Mzab region: *zažžāṛ* 'butcher' (**ǧazzār*), *ʕŏzūž* 'old woman' (**ʕaǧūz*), *zəbš* 'plaster' (**ǧibs*), cf. Cantineau 1938: 9; Grand'Henry 1976: 13.

Saïda: *mzəžža* 'blade shears' (**miǧazza*), *zəžma* 'boot' (**ǧazma*), *zāž* 'he passed' (**ǧāz*), *znāža* 'funeral' (**ǧināza*), *zāmūš* 'big ox' (**ǧāmūs*), cf. W. Marçais 1908: 18.

The Aṛbāʕ tribe (Laghouat): *zəbš* 'plaster' (**ǧibs*), *zaǧǧār* 'butcher' (**ǧazzār*), cf. Dhina 1938: 314.

On the other hand, instances of sporadic cases of sibilant metathesis are:
Moroccan: *zāwəž* 'to forgive (God or a powerful person)' (**ǧāwaza*), cf. De Prémare 1995 (1): 407.
Moroccan / Algerian:
Fez: *lžəzzāʔīr* > *lZəžžāʔīr* 'Algeria' (**al-ǧazāʔir*), cf. Díaz 2015: 60.

3.3.2. Metathesis triggered by the presence of /d/, /l/ or /b/ within the stem:
Although some instances of this type of metathesis are attested in different dialects throughout the whole Maghreb area, pre-Hilali varieties seem to show a greater number of cases. It is important to stress that this metathesis occurs occasionally and only in stems where a historical /ǧ/ appears before a dental, lateral or bilabial consonant, e.g.: **ǧaḏaba* > **ǧdəb* > *žbəd* 'he pulled', **daǧāǧ* > *dǧāǧ* > **ǧdād* > *ždād* 'chicken', **ǧawāb* > *wžāb* 'answer', **saǧǧāda* > *səddāǧa* > *səddāža* 'palm-fiber mat', **ǧawwala* > *lăwwăž* 'to seek' and **ǧawwāl* > *lŭwwāž* 'shared taxi'.
As can be observed from the examples above, the feature [dental] is more prone to favour a reordering of phonological sequences involving */ǧ/. Furthermore, proximity also seems to play an important but secondary role.

3.4. Devoicing
Instances of devoicing affecting /ǧ/ and /ž/ (<*/ǧ/) have been reported for both pre-Hilali and post-Hilali dialects. In Tripoli Arabic and in the Ḥassāniyya dialect of Mauritania, /ž/ has an allophone /š/ when followed by a voiceless consonant, e.g.: *žtəmʕu* ['ʃtəmʕu] 'they got together', *žḥa* ['ʃha] 'Juha', *žḥūš* ['ʃhuːʃ] 'hinnies' (Pereira 2010: 63); *məžtamʕīn* ['məʃtəmʕiːn] 'gathered' (D. Cohen 1963: 28); *zūžtăh* ['zuːʃtah] 'his wife' (W. Marçais 1908: 16). As for other dialects, /ǧ/ may be devoiced in word-final position, e.g.: **waǧh* > *wəǧǧ* > *wətč* 'face' (Cherchell, Grand'Henry 1972: 39); *ħruġ* [ħruːʧ] 'exit' (Maltese).

4. /ǧ/ and /ž/ arising as the output of other phonological processes
There are also cases in which prepalatals /ǧ/ and /ž/ may emerge as the result of different phonological processes:
4.1. /d/ > /ǧ/ (affricatization): *mădxūl* > *măǧxūl* 'money', *dwa* > *ǧwa* 'medicine', *ždīd* > *ždīǧ* 'new' (Touat, Bouhania 2006: 20. Interestingly enough, the main reflex of */ǧ/ in this dialect is /ž/.
4.2. /z/ > /ž/ (palatalization): *zəbda* > *žəbda* 'butter' (Tadla, Bennis 1998: 37).
4.3. /z/~/ž/ (alternation): *zāda~žād* 'else, more' (Touat, Bouhania 2006: 22); *žbīb~zbīb* 'raisins', *lūž~lūz* 'almonds', *žīt~zīt* 'oil', (Fez, Díaz 2015: 60). Here, the occurrence of /ž/ in words that historically displayed /z/ seems to be due to a confusion between both phonemes.

In some dialects, these processes may be accounted for by the influence of a Berber substratum or adstratum:
4.4. /z/ > /ž/ (sibilant harmony): *zūž* > *žūž* 'two' (Morocco and the Algerian region of La Saoura, see supra **3.1.2.**).
4.5. /g/ > /ǧ/ (lenition): *gərgāʕ* > *ǧərǧāʕ* 'walnut', *gaṭo* > *ǧaṭo* 'cake' (Ghazaouet, Hocini 2011: 69).
4.6. /l/ > /ž/ (lenition): *kūl* > *čūž* 'eat!', *qūl* > *qūž* 'say!' (Jijel, Ph. Marçais 1952: 14).

5. Discussion

From the data shown above, one realizes that most Arabic dialects in the Greater Maghreb area are somehow sensitive to the occurrence of a sibilant after a historical /ǧ/. Only Andalusi Arabic, Maltese and some Algerian dialects display a certain stability of */ǧ/ in sibilant environments.

On the basis of the realization of */ǧ/, we can split the modern Maghrebi dialects into two groups. A first group encompasses those dialects in which */ǧ/ is generally pronounced as a fricative /ž/. As for the second group, this includes all dialects displaying an affricate reflex /ǧ/. Except for the Algerian Tell dialects, the latter group exclusively comprises pre-Hilali dialects. On the other hand, the first group contains both pre-Hilali and Hilali dialects. In spite of this current distribution, there seems to be evidence that affricate /ǧ/ was once more widespread and that some dialects exhibiting nowadays /ž/ had once /ǧ/. This fact may be due to internal and/or external linguistic factors. On one hand, /ǧ/ might have shifted to /ž/ following the cross-linguistic trend to avoid voiced affricates (cf. Żygis 2008: 27), on the other hand, it is not unrealistic that pan-Hilali /ž/ spread across pre-Hilali dialects at the expenses of earliest /ǧ/ as a consequence of dialect contact and bedouinisation. Whatever the scenario, it is pretty hard to trace all the present-day reflexes of */ǧ/ back to a single phoneme. For Hilali dialects the issue is simpler and clearer as the overwhelming majority of them present a reflex /ž/. As regards pre-Hilali dialects, the situation is much more complex with */ǧ/ exhibiting several reflexes (/ǧ/, /ž/, /g/, /d/, /z/) within one single vernacular. Although lexical borrowing could partially account for this variation, it remains to be compellingly explained how and why /g/ and /d/ occur instead of */ǧ/ in stems containing a following sibilant.

Various attempts have been made to tackle this problematic shift. For items such as Moroccan *gnāza* 'funeral' or *dăḥš* 'donkey foal', most scholars assume an earlier /ǧ/ which would have undergone dissimilation in sibilant environments. This is the opinion of Brockelmann (1908: 235-236) and W. Marçais & Fleisch (1991: 544). More explicitly, Cantineau (1960: 61) also hypothesizes the existence of earlier pronunciations of */ǧ/ in Moroccan and Algerian Arabic. According to the former author /d/ for */ǧ/ harks back to an older /ǧ/ while /g/ for */ǧ/ derives from a previous /g^{y}/. A similar view is held by Assad (1978: 8) who adds that /g/ for */ǧ/ would rather be due to a regressive phenomenon by which */ǧ/ was replaced with its Proto-Semitic equivalent /g/. Heath (2002: 136) approaches the issue in a similar way and speaks of "a dissimilatory deaffrication whereby affricate *j lost its sibilant release, the remaining stop component being interpreted variously as *g* or *d*". The historicity of the alleged shift /ǧ/ > /g/ has already been put into question by Woidich & Zack (2009: 42) who argued that this development is unusual in most languages. The former authors postulate a reverse sequence of events, whereby the shift */ǧ/ > /g/ would be ascribed to the common Semitic stage /g/ and thought to be a retention rather than a back-shifting of a dental affricate /ǧ/ to a velar /g/. Furthermore, they attempt to account for the puzzling occurrence of g/d (< */ǧ/) in Moroccan Arabic. To put it briefly, Woidich & Zack (2009: 45) make the following two assumptions:

- In a group of dialects A and in stems containing no following sibilants, the velar stop /g/ developed through several steps (/g^{y}/ > /d^{y}/ > /ǧ/) into present-day /ž/. Such a phonetic development did not take place in stems containing a following sibilant where /g/ remained /g/. Thus, **gəbha* became *žəbha* 'forehead' and **gəzz* was retained as *gəzz* 'he sheared'.

- In a group of dialects B the velar stop /g/ became /d^{y}/ at a given stage, then it developed into present-day /ž/ with the exception of stems containing a following sibilant where /d^{y}/ was retained as /d/. In such a scenario, **gəbha* developed into *žəbha* and **gəzz* into *dəzz*.

This solution is very realistic but still problematic as it does not explicitly explain the following questions:

- What is the role of sibilants in preventing /g/ from affricating, i.e. /g/ > g^{y}/ > /d^{y}/ > /ǧ/?
- When did such a phonetic process take place? Had affrication been completed yet in the dialect of the first Muslim invaders by the time they set foot in North Africa? If it had not, how can we account for the fact that no Maghrebi dialect displays /g^{y}/ or /g/ as a general reflex of */ǧ/?
- Why do some lexical items only appear under a single form? There are, for example, no occurrences of *dnāza* 'funeral' or *gəšra* 'village', these words always show up as *gnāza* and *dəšra* respectively.

Moreover, the view held by Woidich & Zack is somehow simplistic as it only focuses on Moroccan Arabic and does not consider the behaviour of /ǧ/ in other Maghrebi dialects. It ignores for instance that in Tlemcen Arabic /d/ for */ǧ/ may occur cross word boundaries, what undoubtedly implies a sporadic dissimilation process where /ǧ/ loses its fricative element in contact with /š/ and surfaces as /d/, e.g.: *zūǧ Šrīfa* > *zūd Šrīfa* 'Šrīfa's husband', cf. W. Marçais 1902: 25.

In what follows I will intend to sift the available evidence to put forward a feasible explanation for the current reflexes of */ǧ/ in the Maghreb dialects.

5.1. The phonetic features of affricate /ǧ/

The evolution of */ǧ/ within the Maghreb dialects, may be better understood if we recall some of the main phonetic properties of this sound. Although the voiced sibilant affricate /ǧ/ (IPA /d͡ʒ/) is generally analyzed as a unit phoneme, it is actually composed of two sounds, a dental stop and a fricative. Accordingly, the production of /ǧ/ takes place in two distinct phases triggering an air pressure conflict: closure and frication. It seems that this aerodynamic and articulatory complexity is responsible for a cross-linguistic tendency to avoid /ǧ/, cf. Żygis 2008: 23, 27, 43. Thus, we find that, in some world languages, this phoneme is often shifted to other sounds which does not involve such a complex articulation. This is especially true when /ǧ/ occurs in relatively close proximity to a homorganic consonant. Indeed, we may already observe in Classical Arabic that roots containing two coronal fricatives are underrepresented, which entails a certain level of constraint on the co-occurrence of these homorganic consonants.

5.2. Hypothesis on the evolution of */ǧ/ in the Maghrebi dialects

Different phonetic processes such as assimilations, dissimilations, and the like may be used to avoid the co-occurrence of homorganic phonemes within a given language. In Maghrebi dialects and as far as */ǧ/ is concerned, there is observable data that suggest the existence of an affricate reflex /ǧ/ at the earliest stage of most pre-Hilali Arabic dialects:

- Affricate /ǧ/ is mainly attested in pre-Hilali dialects, that is the oldest sedentary varieties of the Maghreb, for example those spoken in the Moroccan region of Jbala, in some Algerian coastal towns and in al-Andalus. Furthermore, /ǧ/ occurs in Maltese, a dialect which, due to its geographic location and particular historic evolution, remained relatively impermeable to the influence of Hilali varieties.

- We may presume that in many pre-Hilali dialects which once had /ǧ/, speakers started to adopt fricative /ž/. The reasons for this shift are unclear, however we may point out the following: 1. in several urban pre-Hilali dialects like those of Morocco, speakers borrowed /ž/ from Hilali dialects which having /ž/. This borrowing was made feasible by the bedouinization process undergone by several Moroccan sendentary dialects, 2. in good many pre-Hilali dialects, speakers shifted /ǧ/ to /ž/ as a consequence of an assymetry in the sonority of coronal obstruents. Thus, in most dialects the voiceless counterpart of /ǧ/ is not attested, whereas the contrast between /š/ and /ž/ is phonemically represented. In the last-mentioned scenario, the change was also preferred because of the complex articulatory features of /ǧ/ (see **5.1.**).

- Traces of an earlier affricate pronunciation are to be found in some pre-Hilali dialects which nowadays display a fricative reflex /ž/:

  - In some dialects like Tangiers, Anjra, Tetouan or Chaouen, an affricate allophone of /ž/ occurs when geminate or in the the vicinity of /n/ and /r/.
  - According to authors such as Cantineau (1960: 61), the metathesis *ždād* 'chickens' (**dağāğ*) noted in northern Moroccan dialects, as well as the elision *ǧāǧ* 'chickens' (**dağāğ*) of some northern Algerian dialects, is due to an alleged ancient affricate pronunciation of /ž/.
  - As seen above (**5.**), the occurrence of /d/ for */ǧ/ in stems containing a following sibilant has been explained in two different ways. For some scholars it is a retention of a former /d/, for others it is the output of a dissimilation of an earlier /ǧ/. In support of these latter is the fact that such a phonetic change may also obtain in some dialects at the synchronic level and across word boundaries: *sərǧ zāyəltək* > *sərd zāyəltək* 'the saddle of your mount' (Tlemcen, W. Marçais 1902: 25), *zūǧ šīlān* > *zūd šīlān* 'two shawl' (Algiers, M. Cohen 1912: 80). Nevertheless, the occurrence of similar isolated cases outside the Maghreb area also hints at a case of retention with fossilized items dating back to the stage in which the affrication of /d/ (< proto-Semitic /g/) had not been completed yet.

In sum, there is evidence to think that /ǧ/ did occur in most pre-Hilali dialects but it either converted to /ž/ or underwent dissimilation to /d/.

A more puzzling reflex of */ǧ/ which chiefly occurs in Moroccan pre-Hilali dialects is /g/. In the same way as /d/, /g/ only appears in stems where */ǧ/ is followed by a sibilant consonant, what indicates, as a matter of fact, that both phenomena (i.e. /d/ for */ǧ/, /g/ for */ǧ/) are intimately connected. As seen in section **3.2.3.2.**, further examples of /g/ harking back to */ǧ/ in stems containing a following sibilant are attested in Western Algerian village dialects and to, a lesser

extent, in Maltese. Concerning Western Algeria, the occurrence of the phenomenon under study in localities such as Honaine or Nedroma could be explained as a case of borrowing from the Moroccan Jebli dialects. It is also worth recalling here that the analysis of certain Arabic loanwords in Spanish hints at the existence of a sporadic voiced velar reflex of */ǧ/ in Andalusi Arabic. Corriente has often alluded to a Yemenite imprint on the latter dialect and on Maghrebi Arabic as a whole. On this basis, he argues that instances of /g/ for */ǧ/ in Andalusi Arabic could be traced back to the arrival of Yemenite contingents into Al-Andalus. Despite the existence of other instances showing /g/ for */ǧ/ across Maghrebi dialects, their meagre number does not lend enough support to assume the existence of a single reflex /g/ of */ǧ/ at the earliest stage of Maghrebi Arabic. I am rather of the opinion that several reflexes were already present in early pre-Hilali dialects. Such an assumption could help us explain the variation shown by */ǧ/ in Maghrebi Arabic.

As stated above, we might assume that at a certain stage of the dialects which gave rise to pre-Hilali Arabic varieties, */g/ shifted to affricate /ǧ/. However, affrication was blocked in some of these varieties when the outcome included a sequence of sibilant segments, i.e. /ǧ/ + /s/, /ṣ/, /z/, /š/. Such a co-occurrence restriction may be accounted for by appealing to the so-called Obligatory Contour Principle (OCP), which disallows homorganic adjacent elements within a given structure.

A similar constraint on affrication is found in Qatari Arabic. In this Gulf dialect, /g/ is fronted to /ǧ/ when adjacent to /i/, for instance: *rīg* > *rīǧ* 'saliva' (**rīq*). Nevertheless, affrication is always hampered in the vicinity of /š/, e.g.: *gišir* 'skin of (fruits)' (**qašar*).

5.3. On the Berber origin of /ǧ/ and other affricates

It has been said that the occurrence of affricate /ǧ/ in some Maghrebi dialects may be due to the influence of a Berber substratum and adstratum. Such an assumption is suggestive as many dialects in which */ǧ/ is currently pronounced /ǧ/ are actually spoken in areas where the linguistic imprint left by Berber is still noticeable. This is the case of the Moroccan Jebli dialects which spread west of the Ghomara and Rif regions. This is also the case of the dialects spoken in Algiers and in other Algerian coastal towns located in the vicinity of the Kabylia region. Nevertheless, this fact must be balanced against the following considerations:

- Affricate /ǧ/ also occurs in Maltese and Andalusi Arabic, dialects which apparently show a much weaker influence from Berber.
- Affricate /ǧ/ is absent from the phonemic inventory of proto-Berber and its current presence in several dialects is generally accounted for either as the output of an internal development of an earlier Berber /g/, or as a borrowed consonant occurring in Arabic loanwords.

Borrowing of affricate /ǧ/ may of course, have occurred in given instances and in certain dialects, but we have no evidence to rule out that what happened was rather the opposite, i.e. that Berber borrowed this phoneme from Arabic. Such an assumption would explain why /ǧ/ primarily occurs in northern Berber dialects, i.e. Riffian and Kabyle. On the other hand, it is not unlikely that both Arabic and Berber had this phoneme, what would have helped them retain it. Whatever the scenario was, we have no clear evidence to state who borrowed from whom and the notion that /ǧ/ in some North-African dialects is of Berber origin must, therefore, be regarded as not well-founded.

5.4. Possible evidences for the antiquity of /g/ and /d/ reflecting */ǧ/ in stems containing a following sibilant

5.4.1. The Berber evidence

The inspection of early Arabic loanwords in Berber shows that, in most cases, */ǧ/ is rendered with /ž/ or /ǧ/, the only exceptions being stems containing a preceding or following sibilant, cases in which */ǧ/ is reflected by /g/ e.g.: Riffian: *ṯamzyiḏa* 'mosque, school' (**masǧid*); *ṯagzirṯ* 'island' (**ǧazīra*); *ərăʕgəz* 'laziness' (**al-ʕaǧz*), *agəzzar* 'butcher' (**ǧazzār*), *ərgəsdəṯ* 'body' (**al-ǧasad*), *ərgənazəṯ* 'funeral' (**al-ǧināza*), but *ǧasus* 'stalker' (**ǧāsūs*); Beni Snous dialect (southwest of Tlemcen, Algeria): *ṯižūžəṯ* 'walnut tree' (**ǧawz*), *dzīrəṯ* 'island' (**ǧazīra*), *agəzzār* 'butcher' (**ǧazzār*); Kabyle : *agəzzār* 'butcher', *ləʕġəz* 'laziness'. Further examples are to be found also in Siwa Berber: *aməzdəg* 'mosque' (**masǧid*), *lədsər* 'land by side of canal' (**al-ǧisr*), *əddəš* 'army' (**al-ǧayš*), *adəzzar* 'butcher' (**ǧazzār*).

From the examples above we can infer the following:

- In most receiving Berber dialects, Arabic */ǧ/ was inherited as either /ǧ/ or /ž/, which rules out the possibility of a general /g/ reflex of */ǧ/ in pre-Hilali Arabic.

- /g/ (or /d/) for */ǧ/ usually occur in the same way they do in Arabic dialects, that is in stems containing a following sibilant. This fact is an evidence of the antiquity of the occurrence of /g/ or /d/ for */ǧ/ in the last-mentioned environment. Furthermore, the occurrence of *agəzzār* in kabyle, an Algerian Berber dialect spoken in a region surrounded by people speaking Arabic dialects which do not display any instance of /g/ for */ǧ/, could be interpreted as a trace left by a former Arabic dialect which did have cases of /g/ for */ǧ/.

5.4.2. The Judeo-Arabic evidence

Another evidence could be the fact that most Jewish dialects of Moroccan Arabic present instaces of /g/ or /d/ for */ǧ/ when followed by a sibilant, though in these dialects /ž/ (<*/ǧ/) has merged with /z/. Therefore, words such as **ǧazzār* were inherited in Moroccan Judeo-Arabic as *gəzzār* 'butcher', otherwise the result would have been *zəzzār*. That is to say that by the time when /ž/ turned into /z/ in Moroccan Jewish dialects, /g/ or /d/ already occurred for */ǧ/ in stems containing a following sibilant.

5.4.3. Evidence from other Arabic dialects

The phonetic shift for changing */ǧ/ to /d/ when followed by a sibilant is documented within Maghrebi dialects. Examples such as *dasūs* or *dzīra* attested in Tunis Arabic, where sibilant harmony rules, would come to confirm the existence of an older stage concerning the realization of */ǧ/ in Tunis Arabic. Those words may be seen as fossils showing an earlier pronunciation. Moreover, the presence of *ddəšša* 'tu burp' (**taǧaššaʔa*) and *dšīš* 'coarsely ground' (**ǧašīš*) in several non-related Arabic dialects might also suggest that the shift */ǧ/ > /d/ is very old.

6. Conclusions

With this paper we aimed to look at the behaviour of Arabic */ǧ/ in each single Maghrebi dialect in order to give a further insight into its historical evolution within Maghrebi Arabic as a whole.The following conclusions may be drawn from the present study:

6.1. Reflexes of */ǧ/ in Maghrebi Arabic vary according to the genetic kinship of each dialect and the geographical area in which it is spoken. Affricate /ǧ/ mainly occurs in pre-Hilali dialects, thus we find it in Maltese, in Andalusi Arabic, in the dialects of certain Algerian coastal towns and, partially, in Moroccan Jebli dialects. If one looks at a map of the region, one realizes that all these dialects are actually spoken in regions lying on the northwestern and central northern peripheries of the Maghreb area. On the other hand, fricative /ž/ may be regarded as a salient feature of the overwhelming majority of Hilali dialects. Moreover, it is to be found in many present-day pre-Hilali dialects in which it might have originated internally as an allophone of /ǧ/, or it might be due to borrowing from Hilali dialects. Whatever the reason, /ǧ/ deaffricated to /ž/ in a good number of first-layer dialects, a phonetic process which was made desirable and feasible by two factors: the absence of a voiceless counterpart of /ǧ/ in Maghrebi Arabic and the cross-linguistically tendency to avoid voiced sibilant fricatives.
It has been said that the presence of /ǧ/ in pre-Hilali dialects is related to the general spirantization trend that characterizes rural dialects and that also takes place in Northern Berber dialects. I do not think so, but if this phenomenon had already started in Berber when the first Arabs showed up in North Africa, it is likely that it boasted the preservation of /ǧ/. Whatever it was, Maltese *ġ* /ǧ/ may be regarded as a piece of evidence for the dating of /ǧ/ as this dialect became isolated from the Arabic-speaking world after 1090.

6.2. Except for Maltese, Siculo-Arabic, Andalusi Arabic and certain Algerian vernaculars, all Maghrebi dialects display different sorts of systematic co-occurrence restrictions in sibilant sequences containing /ǧ/ or /ž/. Thus, we find that in Moroccan Arabic and, to a lesser extent, some Algerian dialects, dissimilation to /d/ seemingly obtains between an old /ǧ/ and another subsequent sibilant anywhere in the stem. By the same token, /ž/ undergoes metathesis in some Algerian Bedouin dialects when in stems containing a following sibilant. On the other hand, a common denominator of most Moroccan dialects and the Algerian dialect of La Saoura is the assimilation of /z/ to a following /ž/. Lastly, we find that the assimilation of /ž/ to a previous or following sibilant constitutes a feature that spreads from Cirenaica to Mauritania outlining a crescent moon shape. Such a fact can be read as an evidence of a kinship relating the Hilali dialects of Tunisia and Libya to Hassanya.
A connection may be established between all these phonetic shifts and the phonetic properties of /ǧ/ and /ž/.

6.3. Considering that /ž/ is the pre-palatal counterpart of /z/, the voiced sibilant reflex /z/ characteristic of Moroccan Jewish dialects can be better understood if we presume a shift from /ž/ rather than from /ǧ/. Unless I am very much mistaken, this means that the shift /ž/ > /z/ is subsequent to the dissimilation of /ǧ/ to /d/ in sibilant stems such as *dāz* 'he passed' (<**ǧāz*), what could be interpreted as another evidence of a wider diffusion of affricate /ǧ/ at the earliest stages of pre-Hilali dialects.
As regards the occurrence of this shift in the Muslim dialects spoken in some old medinas, it is noteworthy that the phenomenon is primarily attested in cities which hosted important Jewish

communities (i.e. Fez, Tetouan...). Could it be this a Jewish feature borrowed by the Muslim dwellers of the medina? But how to explain such a phonetic borrowing? The shift /ž/ > /z/ likely originated from the confusion of these two phonemes and the subsequent prevalence of the simplest sound, i.e. /z/, which, for some unknown reasons, would have become later on a distinctive linguistic feature of the Jewish community, and maybe, that of a formerly thriving social class living in the medina. In sum, the reflex /z/ of */ǧ/ may be viewed as a late feature of some Moroccan pre-Hilali dialects.

6.4. */ǧ/ systematically arises as /g/ when followed by a sibilant in most northern Moroccan dialects, what suggests clear link between /d/ (<*/ǧ/) and /g/ (<*/ǧ/). Even if only marginally, the occurring of the latter in Maltese and in some fosilized Arabic loanwords recorded in Berber dialects might provide some clues on the antiquity of the reflex /g/ and on the chronological evolution of */ǧ/. It is worth highlighting that /g/ for */ǧ/ when in sibilant stems mainly occurs in dialects displaying, at least occasionally, an affricate allophone /ǧ/. In other words, the geographic distribution of the affricate reflex /ǧ/ partially overlaps with the occurring of /g/ in stems containing a following sibilant.

6.5. As put forward by Cantineau 1960, it can be hypothesized that the occurrence of further sibilants within the stem hampered the affrication of /g/ in Tangiers *ʕgūza* and triggered a dissimilation of /ǧ/ in El Jadida *ʕdūza*. It is logically tempting to see in this latter example another case of retention reflecting an intermediate stage in the fronting of proto-Semitic /g/, however the occurrence of /d/ for */ǧ/ in some dialects across word boundaries is good evidence to suppose a dissimilation instead. In my opinion, pre-Hilali dialects already showed at their earliest stages roughly the same picture they display nowadays, that is the co-occurrence of conditioned /g/ and/or /d/ together with /ǧ/ and /ž/ within one single dialect. Such an assumption would allow us to account for items displaying sibilant harmony in pre-Hilali dialects where this phonetic process is quite unusual. An example of these is *bəzzāf* (<**bi-l-ǧizāf*), which can be better explained if we assume an earlier form **b-əž-ززāf*.
As said above, I think that *ʕdūza* is a dissimilation of *ʕǧūza*, nevertheless I am aware of the chief stumbling block that stands in the way of this explanation: */ǧ/ systematically arises as /d/ in stems containing a following sibilant in many Moroccan Hilali dialects which have no trace of an affricate reflex /ǧ/. How to account for the presence of this phenomenon in a group of dialects which are genetically unrelated to the pre-Hilali ones? Could it be explained by appealing to borrowing? It might be for some lexical items like *dhāz* 'trousseau', but for others related to the countryside such as *dăḥš* 'donkey foal' or *dəšra* 'village' I am quite dubious.

To conclude, it is likely that */ǧ/ had already several realizations at the time Arab invaders came into the Maghreb. The comparative study of current phonetic phenomena involving */ǧ/ gives us a clue to what changes may have occurred in the past. Furthermore, they indicate a probable sequence of these changes. Although many points still need elucidation, our investigation shows that */ǧ/ is subjetc to co-occurrence restrictions in most dialects of Maghrebi Arabic. Among others, the commonest constraint is the one that restricts the occurrence of /ǧ/ or /ž/ in sibilant stems.

We hope that answers will be given soon for the questions left open by this paper.

References

- Aguadé Jordi, "Estudio descriptivo y comparativo de los fonemas del árabe dialectal marroquí", *Estudios de Dialectología Norteafricana y Andalusí* 7 (2003), p. 59-109.
- Aïda Moufida, *Dialectal Variation and Sound Change. A Phonological Study of the Arabic Dialect of Honaine*, unpublished PhD thesis, University of Tlemcen, 2015.
- Alderete Jhon D. & Frisch Stephan A., "Dissimilation in grammar and the lexicon", in *The Cambridge Handbook of Phonology*, ed. Paul de Lacy, Cambridge, Cambridge University Press, 2007, p. 379-398.
- Ammour Naima, *A Sociolinguistic Investigation of Language Variation in the Speech Community of Nedroma*, unpublished PhD thesis, University of Tlemcen, 2012.
- Assad Mohamed, *Le parler arabe de Tanger*, unpublished PhD thesis, University of Gothenburg, 1978.
- Bennis Saïd, "Contact des parlers arabes au Maroc. Cas de la pleine du Tadla", *Langues et Littératures* 16 (1998), p. 35-44.
- Behnstedt Peter, "Árabe yemení", in *Manual de dialectología neoárabe*, eds. F. Corriente & Á. Vicente, Zaragoza, Instituto de Estudios Islámicos y del Oriente Próximo, 2008, p. 97-149.
- Behnstedt Peter, "Voces de origen sirio y yemení en el árabe magrebí/andalusí", in *Sacrum arabo-semiticum: homenaje al profesor Federico Corriente en su 65 aniversario*, eds. J. Aguadé, L. Abu-Shams, Á. Vicente, Zaragoza, Instituto de Estudios Islámicos y del Oriente Próximo, 2005, p. 115-122.
- Behnstedt Peter & Benabbou Mostafa, "Zu den arabischen Dialekten der Gegend von Taza (Nordmarokko)", in *"Sprich doch mit deinen Knechten aramäisch, wir verstehen es!". 60 Beiträge zur Semitistik. Festschrift für Otto Jastrow zum 60. Geburtstag*, eds. W. Arnold & Hartmut Bobzin, Wiesbaden, Harrassowitz, 2002, p. 53-72.
- Behnstedt Peter & Benabbou, Mostafa, "Données nouvelles sur les parlers arabes du Nord-Est marocain", en *Zeitschrift für arabische Linguistik* 44 (2005), p. 18-70.
- Behnstedt Peter & Woidich Manfred, *Wortatlas der arabischen Dialekte. Band I: Mensch, Natur, Fauna, Flora*, Leiden-Boston, Brill, 2011.
- Behnstedt Peter & Woidich Manfred, *Wortatlas der arabischen Dialekte. Band III: Verben, Adjektive, Zeit und Zahlen*, Leiden-Boston, Brill, 2014.
- Blanc Haïm, "The fronting of Semitic *g* and the *qāl-gāl* Dialect Split in Arabic", in *Proceedings of the International Conference on Semitic Studies held in Jerusalem, 19-23 July 1965*, Jerusalem, Israel Academy of Sciences and Humanities, 1969, p. 7-37.
- Bouhania Bachir, "Langue arabe et dialectes du Touat. Approche sociolinguistique", *Les Annales du Patrimoine* 6 (2006), p. 19-26.
- Brockelmann Carl, *Grundriss der vergleichenden Gramatik der semitischen Sprachen. I Band: Laut- und Formenlehre*, Berlin, Verlag von Reuther & Reichard, 1908.
- Camilleri Jhon, *A Computational Grammar and Lexicon for Maltese*, M.Sc Chalmers University of Technology, Gothenburg, Sweden, 2013. http://mlrs.research.um.edu.mt/resources/gabra/ (accessed 4 September 2016).
- Cantineau Jean, *Cours de phonétique arabe. Suivi de notions générales de phonétique et de phonologie*, Paris, C. Klincksieck, 1960.

- Cantineau Jean, *Les parlers arabes du Ḥōrân : notions générales, grammaire*, Paris, C. Klincksieck, 1946.
- Cantineau Jean, "Les parlers arabes du département d'Oran", *Revue Africaine* 84 (1940), p. 220-231.
- Cantineau Jean, "Les parlers arabes du département de Constantine", *Extrait du Quatrième Congrès de la Fédération des Sociétés Savantes de l'Afrique du Nord*, Alger, Société Historique Algérienne, 1938.
- Cohen David, *Le dialecte arabe Ḥassānīya de Mauritanie* (*parler de la Gəbla*), Paris, C. Klincksieck, 1963.
- Cohen Marcel, *Le parler arabe des Juifs d'Alger*, Paris, Librairie ancienne H. Champion, 1912.
- Colin Georges S., "Notes sur le parler arabe du nord de la région de Taza", *Bulletin de l'Institut Français d'Archéologie Française* 18 (1921), p. 33-119.
- Corriente Federico, Pereira Christophe & Vicente Ángeles, *Aperçu grammatical du faisceau dialectal arabe andalou. Perspectives synchroniques, diachroniques et panchroniques*, Berlin, de Gruyter, 2015.
- Corriente Federico, "Again on the "Yemenite connection" of Andalusi Arabic and the other Western Arabic dialects", *Folia Orientalia* 51 (2014), p. 1-26.
- Corriente Federico, *A Descriptive and Comparative Grammar of Andalusi Arabic*, Leiden-Boston, Brill, 2013.
- Corriente Federico, "Nuevos arabismos en el vocabulario del noroeste murciano", *Revista de Filología Española* 85 (2005), 2º, p. 225-244.
- Dallet J.-M., *II Dictionnaire Français-Kabyle, Parler des At Mangellat. Algérie*, Paris, SELAF, 1985.
- De Prémare Alfred Louis, *Dictionnaire arabe-français.* (*Etabli sur la base de fichiers, ouvrages, enquêtes, manuscrits, études et documents divers par A.L. de Prémare et collaborateurs*. Vols 1-12, Paris, L'Harmattan, 1993-1999.
- Destaing Edmond, *Dictionnaire français-berbère: dialecte des Beni-Snous,* Paris, L'Harmattan, 1914.
- Dhina A., "Notes sur la phonétique et la morphologie du parler des ´Arbâɛ", *Africaine* 82 (1938), p. 313-353.
- Díaz Virginia, *Estudio del dialecto árabe marroquí de la ciudad de Fez*, unpublished PhD thesis, Complutense University of Madrid, 2015.
- Ferguson C.A., "The /g/ in Syrian Arabic: filling a gap in phonological pattern", in *Linguistic Studies Presented to André Martinet on the Occasion of his 60th Birthday*, Part III, ed. A. Juilland, Non-Indo-European Linguistics. New York, International Linguistics Association, 1969, p. 114-119.
- Grand'Henry Jacques, "Le parler arabe de la Saoura (Sud-ouest algérien)", *Arabica* 26 (197), p. 213-228.
- Grand'Henry Jacques, *Les parlers arabes de la région du Mzāb* (*Sahara algérien*), Leiden, Brill, 1976.
- Grand'Henry Jacques, *Le parler arabe de Cherchell* (*Algérie*), Louvain-la-Neuve, Université Catholique de Louvain, 1972.
- Guerrero Jairo, "A phonetical sketch of the Arabic dialect spoken in Oran (North-western Algeria)", in *Arabic Varieties: Far and Wide. Proceedings of the 11th International Conference*

of AIDA. Bucharest 2015, eds. G. Grigore & G. Biţună, Bucharest, Editura Universităţii din Bucureşti, 2016, p. 273-280.

- Guerrero Jairo, *El dialecto árabe hablado en la ciudad marroquí de Larache,* Zaragoza, Prensas de la Universidad de Zaragoza, 2015a.
- Guerrero Jairo, "Preliminary notes on the current Arabic dialect of Oran (western Algeria)", *Romano-Arabica* 15 (2015b), p. 219-233.
- Heath Jeffrey, *Jewish and Muslim dialects of Moroccan Arabic*, London-New York, Routledge Curzon, 2002.
- Hocini Abdelkader, *A Sociolinguistic Study of Ghazaouet Speech Community. Phonological, Morphological and Lexical Variation*, unpublished PhD thesis, University of Tlemcen, 2011.
- Iraqui-Sinaceur Zakia, "Le dialecte de Tanger", in *Peuplement et arabisation au Maghreb Occidental. Dialectologie et histoire*, eds. P. Cressier, J. Aguadé, Á. Vicente, Madrid-Zaragoza, Casa de Velázquez-Universidad de Zaragoza, 1998, p. 131-140.
- Kampffmeyer Georges, "Südarabisches. Beiträge zur Dialektologie des Arabischen III", *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 54 (1900), p. 621-660.
- Kaye Alan, "Arabic /žīm/: A Synchronic and Diachronic Study", *Linguistics* 79 (1970), p. 31-72.
- Kossmann Maarten, *The Arabic Influence on Northern Berber*, Leiden, Brill, 2013.
- Lentin Jerôme, "L'arabe parlé en Sicile était-il un arabe périphérique ?", *Romano-Arabica* 6-7 (2006-2007), p. 71-84.
- Lévy Simon, *Parlers arabes des Juifs du Maroc. Histoire, sociolinguistique et géographie dialectale*, Zaragoza, Instituto de Estudios Islámicos y del Oriente Próximo, 2009.
- Lévy Simon, "Problématique historique du processus d'arabisation au Maroc: Pour une historie linguistique du Maroc", in *Peuplement et arabisation au Maghreb Occidental. Dialectologie et histoire*, eds. P. Cressier, J. Aguadé, Á. Vicente, Madrid-Zaragoza, Casa de Velázquez-Universidad de Zaragoza, 1998, p. 11-26.
- Marçais Philippe, *Le parler arabe de Djidjelli* (*Nord Constantinois, Algérie*), Paris, Librairie d'Amérique et d'Orient Adrien-Maisonneuve, 1952.
- Marçais Philippe, "Algeria", *Encyclopaedia of Islam* 1 (1991), p. 374-379.
- Marçais William, *Textes arabes de Tanger. Transcription, traduction annotée et glossaire*, Paris, E. Leroux, 1911.
- Marçais William, *Le dialecte arabe des Ūlād Bṛāhîm de Saïda* (*Département d'Oran*), Paris, E. Bertrand, 1908.
- Marçais William, *Le dialecte arabe parlé à Tlemcen. Grammaire, textes et glossaire*, Paris, E. Leroux, 1902.
- Marçais William & Fleisch Henry, "*Ḏjīm*", *Encyclopaedia of Islam Vol. II* 2nd ed (1991). Leiden: E.J. Brill, p. 543-545.
- Messaoudi Leila, "Urbanisation linguistique et dynamique langagière dans la ville de Rabat", *Cahiers de Sociolinguistique* 6 (2001), p. 89-100.
- Messaoudi Leila, "Traits linguistiques du parler arabe de Rabat", in *Peuplement et arabisation au Maghreb Occidental. Dialectologie et histoire*, eds. J. Aguadé, P. Cressier & A. Vicente, Madrid-Zaragoza, Casa de Velázquez-Universidad de Zaragoza, 1998, p. 157-164.
- Messaoudi Leila, "Note sur l'affriquée /ǧ/ dans le parler Jbala (nord du Maroc)", *Estudios de Dialectología Norteafricana y Andalusí* 1 (1996), p. 167-175.

- Mustafawi Eiman, "The OCP as a synchronic constraint in Arabic", *Canadian Journal of Linguistics/Revue Canadienne de Linguistique* 56, 2 (2011), p. 229-246.
- Natividad Emma, "Le dialecte de Chefchaouen", in *Peuplement et arabisation au Maghreb Occidental. Dialectologie et histoire*, eds. J. Aguadé, P. Cressier & A. Vicente, Madrid-Zaragoza, Casa de Velázquez-Universidad de Zaragoza, 1998, p. 109-120.
- Pereira Christophe, *Le parler arabe de Tripoli* (*Libye*), Zaragoza, Instituto de Estudios Islámicos y del Oriente Próximo, 2010.
- Pottier René, *Histoire du Sahara*, Paris, Nouvelles éditions latines, 1947.
- Puech Gilbert, "Prime constituents of Maltese sounds", in *Perspectives on Maltese linguistics*, eds. A. Borg, S. Caruana, A. Vella, Berlin, Akademie Verlag GmbH, 2014, p. 61-88.
- Ritt-Benmimoun Veronika, "The Tunisian Hilāl and Sulaym dialects. A preliminary comparative study", in *Alf lahǧa wa lahǧa. Proceedings of the 9th Aida Conference*, eds. O. Durand, A.D. Langone & G. Mion, Vienna, Lit Verlag, 2014, p. 351-359.
- Sarrionandia Pedro Hilarión & Ibáñez Robledo, Esteban, *Diccionarios Español-rifeño. Rifeño-español,* Melilla-Barcelona, Bellaterra, 2007.
- Simeone-Senelle Marie-Claude, "The Modern South Arabian Languages", in *The Semitic Languages*, ed. Hetzron R., London, Routledge, 1997, p. 378-423.
- Singer, Hans-Rudolf, *Grammatik der arabischen Mundart der Medina von Tunis*. Berlin-New York: de Gruyter, 1984.
- Singer Hans-Rudolf, "Neuarabische Texte im Dialekt der Stadt Tetuan", *Zeitschriften der Deutschen Morgenländischen Gesellschaft* 108 (1958), p. 106-125.
- Souag Lameen, *Berber and Arabic in Siwa. A Study in Linguistic Contact*, Köln, Rüdiger Köppe Verlag, 2013.
- Stroomer Harry, "The Arabic dialect of women in Meknès (Morocco): Gender linked sound changes?", in *Approaches to Arabic Dialects. A Collection of Articles presented to Manfred Woidich on the Occasion of his Sixtieth Birthday*, eds. M. Haak, R. de Jong, K. Versteegh, Leiden-Boston, Brill, 2014, p. 291-307.
- Taine-Cheikh Catherine, "Les altérations conditionnées des chuintantes et des sifflantes dans les dialectes arabes", *Comptes rendus du GLECS* 24-28, 1979-1984 (1986), p. 413-435.
- Vicente Ángeles, "Árabe de Ceuta. Visitas a Marruecos", in Á. Vicente & J. Guerrero (coords.), *Corpus ORal de VAriedades Magrebíes*, 2016. http://www.unizar.es/estudiosarabes/CORVAM.htm
- Vicente Ángeles, *El dialecto árabe de Anjra* (*norte de Marruecos*). *Estudio lingüístico y textos*, Zaragoza, Universidad de Zaragoza, 2000.
- Woidich Manfred & Zack Liesbeth, "The g/ǧ question in Egyptian Arabic revisited", in *Arabic Dialectology. In Honour of Clive Holes on the Occasion of his Sixtieth Birthday*, eds. E. Al-Wer & R. de Jong, Leiden-Boston, Brill, 2009, p. 41-60.
- Zaborski Andrzej, 'Jim', *Encyclopedia of Arabic Language and Linguistics* Vol. III (2007), p. 494-496.
- Zellou Georgia, "Moroccan Arabic Consonant Harmony: A Multiple Causation Hypothesis", in *Toronto Working Papers in Linguistics* 33 (2010).
- Żygis Marzena, "On the avoidance of voiced sibilant affricates", *ZAS Papers in Linguistics* 49 (2008), p. 23-45.